Most economists agree on how to tackle climate change. Can politicians make it happen?
Most of us would agree that climate change is a problem, but it’s a chronic problem, easily forgotten. Melting ice caps and changing weather patterns have become background noise to whatever made headlines this morning. And there is no political consensus on the policies needed to tackle global warming.

But there is something of a consensus among economists—43 of whom, including 27 Nobel laureates, signed a joint statement in the Wall Street Journal in January calling for the United States to adopt a carbon tax. Most think that climate change is best addressed by establishing a price for carbon-dioxide emissions. If we were to recognize and pay the true cost for those, we would adjust our behaviors and economies in a rational way. A carbon tax, the argument goes, would guide consumers toward more environmentally friendly choices: electric cars instead of gas-guzzlers, public transport instead of private, solar or wind power instead of coal-generated electricity.

If economists can agree, why aren’t governments across the world implementing carbon taxes? In our cover story (page 28), Chicago Booth’s Robert H. Topel explains where some carbon-tax critics are coming from. And in our Footnotes section, Stanford’s John H. Cochrane suggests some ways to move a carbon tax forward (page 64).

Robots, regulation, and the reinvention of communities

As Cochrane highlights, some people resist taxes because they don’t trust government and abhor all regulation. They find their natural spiritual home at the University of Chicago, which has long given intellectual succor to free marketeers.

But thinking on the role of regulation is changing. As our other feature article (page 40) notes, researchers are recognizing nuance and complexity between oversight and behavior. Regulation, their research suggests, can in some cases lead to healthier markets.

Elsewhere in this issue, University of Chicago and Booth’s Lars Peter Hansen, whose work won him a Nobel Prize in Economic Sciences in 2013, describes why it’s hard for people to agree on rules that should be implemented. It’s fine to want policy based on evidence, but even if the evidence collected is objective, the frameworks used to interpret it are not (page 56). Many are hoping technology, not regulation, will solve our global-warming issue. In the meantime, technology is also transforming the way we live. In an excerpt from his new book The Third Pillar, Booth’s Raghuram G. Rajan writes that the revolution in information and communications technology is redistributing jobs and wealth (page 53). In our Q&A, he elaborates, and explains how this revolution will require us to reinvent communities (page 12).

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Editors’ Letter

A RARE CASE OF ECONOMISTS AGREEING

“I think even many of those who confidently predicted a crisis didn’t anticipate how catastrophic it would be for the global economy.”

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Cover illustration by Kelsey Dake

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“ I think even many of those who confidently predicted a crisis didn’t anticipate how catastrophic it would be for the global economy.”
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The longstanding debate about government oversight is giving way to a new understanding of how to craft more effective industry rules. By Brian Wallheimer

Why the environment is so hard to regulate

By Charles Upton

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By Robert H. Topel, Isidore Brown and Gladys J. Brown Distinguished Service Professor of Economics, a founding codirector of the Energy Policy Institute at the University of Chicago, the author of many professional articles, and the coeditor of several books. In this issue, he explains what’s behind the opposition to a carbon tax. (Page 28)

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TRUMP DOESN’T DISCOURAGE THIS TRADER

Trump’s trade-policy uncertainty deters investment (Winter 2018/19)

Didn’t deter me from investing—i.e., going long on volatility!

—Vincent Chung

WHERE’S YOUR UNICORN?

Equity crowdfunding is inflating a bubble (Winter 2018/19)

As long as a few large investors get filthy rich, the gears will keep turning.

—untoldbumpkins

WHAT COULD FIX HEALTH CARE

Dan Adelman says health care has a data opportunity (Winter 2018/19)

I think the reason for the under-development in health care is that the specialist’s role is limited to a certain extent. Health care is a huge problem, and we have been unable to follow up with it. Every single thing can affect it, such as culture, income level, pollution, and more. We must link public health with health-care science. In my view, there is no institution or organization that can handle the problems of health care, whether financially or informally, if there isn’t strong government support. Governments must understand that citizens are the human resources. Their health is important for the growth and development of society.

—abdul_usa

EQUALITY IS GOOD ECONOMICS

How to get more woman CEOs (Winter 2018/19)

If we agree that innate talent is equally distributed between men and women, superior economic outcomes would be achieved if women had the same odds as men to make it to the top of the earnings distribution.

—Luz Ramirez

LOVE IT, LAND IT

To land a job, say how much you love the work (Winter 2018/19)

It is worth remembering before your next job interview that interviewers often value your intrinsic motivation (or love of the work) more than you think. People sometimes feel it’s implied that they’re interested in a role because they’re #interviewing for it. That’s not always the case. Expressing your passion for the work can increase your chances of getting an offer.

#jobinterview #jobsearch

—Daniel Katz

DON’T HOG THE LANE

Should cities set limits on ride sharing? (Winter 2018/19)

Yes ... because of something called dis/economics, loss of productivity in other areas of an urban economy when one firm continues to grow without any restrictions.

—Samuel Olabode Awoliyi
Ride-sharing applications such as Uber and Lyft have ushered in an era of convenience for cab-hailing consumers. People needing transport can now summon door-to-door service using their phones, often for less than the price of a traditional taxi. And proponents have noted other potential advantages, including fewer drunk drivers on the road, more carpooling, and less car ownership.

But Chicago Booth’s John Barrios, Rice University’s Yael V. Hochberg, and Rice PhD candidate Liviu Hanyi Yi find significant costs associated with ride sharing. Most notably, they link ride sharing to a rise in auto-related deaths.

The researchers built a model around the hypothesis that a combination of cheap, convenient rides for passengers and easy income opportunities for drivers would increase the number of cars on the road. In their model, the average quality of drivers changes as some people shift from driving to ride sharing, while others become ride-share drivers. Accidents are a function of vehicle miles traveled (VMT) and average driver quality, which encompasses driving skill as well as intoxication or impairment.

The researchers conducted quarterly observations of large US cities between 2001 and 2016, and they used staggered roll-out dates from Uber and Lyft to review the eight quarters preceding and following ride sharing adoption by the cities in the sample.

She’s back in business …

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Given an out, people still fall back into debt

T
he frustration of financial counselors everywhere, millions of people doomed themselves to perpetual debt by repeatedly taking out small but expensive short-term loans they can barely afford. In the United States, these typically come from payday or car-title lenders and go to financially strapped individuals. In developing countries, small-scale entrepreneurs rely on daily or weekly loans for working capital. In both cases, borrowers pay exorbitant interest rates and, often, additional fees to extend a loan over and over. Interest payments can quickly add up to more than the loan amount.

Understanding how people get sucked into these debt traps is an important public policy issue, according to Northwestern’s Dean Karlan, Chicago Booth’s Sendhil Mullainathan, and Harvard’s Benjamin N. Roth. They conducted a series of experiments with indebted entrepreneurs in India and the Philippines and find that having short-term loans pay off took the participants out of debt only temporarily. The entrepreneurs in question quickly took out new, profit-sapping loans. An increase in high-quality ride-share drivers could have offset increased VMT and potentially increased driver quality is complicated, according to the researchers. In an increase in high-quality ride-share drivers could offset increased VMT and potentially reduce accident rates; however, while some poor drivers may substitute ride sharing for driving, other passengers may be skilled drivers who simply enjoy the convenience. At the same time, lesser-quality drivers may be tempted to drive for ride-sharing services. Ride sharing is relatively new, the researchers acknowledged, and they recognize that the benefits of the trend include increased options for disabled passengers and employment opportunities for drivers.

In calculating the welfare effects for cities, in these experiments, completed in 2007 and 2010, the researchers provided brief financial training to market vendors who had high-interest debt. The Indian entrepreneurs were paying an average monthly rate of 432 percent, while the Philippine borrowers averaged 13 percent in monthly interest costs, according to the study. By comparison, annual rates on payday loans in the US range from about 390 to 780 percent (according to the nonprofit Consumer Federation of America), which translates to average monthly rates of 12 to 74 percent.

The training delivered the message that borrowing from moneylenders was far more expensive than alternatives such as reducing consumption. The researchers then paid off the moneymolder debts of some of the participants—improving social services might be important public policy, according to the researchers. In the United States, these typically come from payday or car-title lenders and go to financially strapped individuals. In developing countries, small-scale entrepreneurs rely on daily or weekly loans for working capital. In both cases, borrowers pay exorbitant interest rates and, often, additional fees to extend a loan over and over. Interest payments can quickly add up to more than the loan amount.

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The result: more cars on the road, more congestion, and more accidents. The researchers further find that the intensity of ride-share use, based on Google searches for terms such as “Uber” and “Lyft” in the cities studied, was linked to an increase in auto fatalities. (While riders typically hail ride-sharing cars through apps, Google searches for “Uber” are strongly correlated with the number of active drivers per capita in each market.) The apps’ carpooling features didn’t markedly decrease total VMT, the research finds, nor did they reverse the increase in fatalities, possibly in part because carpooling is just 20 percent of overall rides.

Evaluating the effect of ride sharing on driver quality is complicated, according to the researchers. An increase in high-quality ride-share drivers could offset increased VMT and potentially reduce accident rates; however, while some poor drivers may substitute ride sharing for driving, other passengers may be skilled drivers who simply enjoy the convenience. At the same time, lesser-quality drivers may be tempted to drive for ride-sharing services. Ride sharing is relatively new, the researchers acknowledged, and they recognize that the benefits of the trend include increased options for disabled passengers and employment opportunities for drivers. In calculating the welfare effects for cities, this uptick in new vehicles suggests to the researchers that consumers used ride sharing to replace trips on public transit—and some may have purchased cars specifically for ride sharing.

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How charities can avoid turning off potential donors

Charities dealing with distressing topics such as illness, starvation, or war have to walk a fine line: they need to increase awareness of what they do without turning off potential supporters and donors. An image of a starving child might get attention online—but also be too difficult for some people to view.

University of Hong Kong’s Sara Kim, a graduate of Chicago Booth’s PhD Program, and Booth’s Ann L. McGill suggest a possible fix for this emotionally tricky situation by reminding people of their individual existence and value. This “self-affirmation,” which centers on one’s sense of possessing integrity, can prompt a potential donor to help a charity in response to three threatening images, instead of looking away.

When people turn away from painful images, they feel guilty, which presents a difficult cognitive and emotional situation. “To get out of this bind, people might downplay others’ misfortunes—for example, by characterizing them as relatively minor or, where undeniably substantial, as unfortunate but nevertheless commonplace troubles that do not require a call to action,” the researchers write.

Kim and McGill wondered what behavioral strategies might counteract this reasoning, that if people were reminded of who they are at heart—of their distinct identity—they might be less likely to downplay others’ misfortunes because they would not feel threatened or defensive.

Self-affirmation is a difficult concept to articulate, McGill says. “It’s a Popeye-like sense of ‘I am what I am.’ Just feeling fine about what I am.”

In one experiment, the researchers had participants carry out a self-affirmation task in which they reflected on a time in their lives when an important personal value—such as artistic skills, sense of humor, or athleticism—had played a central role. This task was intended to affirm participants’ sense of personal integrity, although the values themselves were not directly related to helping others. Other participants, serving as a control group, wrote about a value that was not personally important but might be important to others.

Then all the participants read about a charity that raised awareness of the safety of children’s products, in part by sharing stories of families who had lost a child to a defective product. The researchers measured each group’s likelihood of sharing a Facebook post about the charity.

Among participants who weren’t parents, those who had done the self-affirmation task were significantly more likely to say they’d share the post than those in the control group.

For parents, it made no difference. Self-affirmation worked only if participants didn’t identify too closely with the victims, the researchers find. And in this case, parents felt the issue was hand to hand too, personally and Kim and McGill reason.

The researchers saw similar results when they replaced the child-safety charity with a nonprofit that promoted breast-cancer screening and measured participants’ interest in and donations to it. Male participants who did the self-affirmation task read about the charity for longer and donated more money to it. Women who did the same self-affirmation task behaved about the same as women who did not.

The findings suggest that charities may want to consider self-affirmation as a way to help would-be donors embrace a difficult topic more readily—but only if they’re not too close to the situation to begin with.

Knowing people are in need “may not be sufficient to produce actual helping behaviors, and appeals that play up the magnitude of the need could even backfire,” the researchers write. “The ‘catch’ is that potential donors might be motivated to turn a blind eye to the distressing information, particularly if they do not relate to the victims. The current research suggests that self-affirmation can help to ‘turn off’ this disregard.”—Alise G. Walton

Student loans can spur more homeownership

Student loan debt is frequently held out as Exhibit A for why homeownership among young adults has been falling. More than 80 percent of millennials carry college debt as their reason for renting longer, and the resulting delay in home buying averages seven years, according to a survey by the National Association of Realtors.

Despite this, increased funds available from student loans may have actually bolstered home buying for some people, according to the Federal Reserve’s Sarena Goodman, the US Treasury Department’s Adam Isen, and Chicago Booth’s Constantine Yannelis.

The researchers studied student debt and homeownership rates between 1998 and 2013, focusing on differences attributable to student loans in the year student borrowers turned 24, a significant marker in the federal student-loan system. Undergraduate borrowers aged 21 and younger were considered dependents of their parents, while those who turn 24 before January of a given school year are deemed independent and have higher annual borrowing limits.

“Contrary to much of the public discourse, increased access to loan dollars appears to be commensurate with more homeownership,” Goodman, Isen, and Yannelis write.

Borrowers who turned 24 by the January deadline received about 40 percent more in federal loans and grants, the researchers find. Some of that money was used to “help student borrowers finance important noneducation spending,” including buying a home.

Homeownership for these borrowers was persistently about a half point higher over the next several years than for those with birthdays after the cutoff. For each additional $10,000 in federal loans, homeownership increased by 2.4 percentage points, the researchers estimate.

“Increased liquidity best explains our results,” write the researchers, who didn’t find evidence consistent with other factors such as the possible increase in wages as a result of higher educational attainment for these borrowers.

“The conclusions suggest student loans could have benefits beyond education, as borrowers use the extra cash to finance other things, such as housing—something policy makers could consider when making decisions about student-loan limits.”—Carla Fried

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Spring 2019

Spring 2019
Raghuram G. Rajan says capitalism’s future lies in stronger communities

Katherine Dusak Miller
Distinguished Service Professor of Finance

**Q1** You have a new book out called *The Third Pillar*. What is the third pillar? It is the community. Around the world, there is widespread economic anxiety, domestic political tension, drift between countries, and now talk of a cold war reemerging between the United States and China. On one side, there’s a big technological revolution, it upsets the balance in society between three pillars: the political structure—that is, government or the state; the economic structure—that is, market and firms; and the sociological, human structure—that is, communities. When that balance is upset, we see anxiety and conflict, a signal that we’ve stepped into a new phase.

To really understand capitalism’s success, one has to understand the important role of the community. As it voices its concerns through democracy, the community is critical to maintaining the balance between the state and markets. When the community is appropriately motivated and engaged, it enables liberal market societies to flourish.

Recently, some communities have been weakened significantly while others have grown. The logical change is creating a new meritocracy, but one that is turning out to be largely hereditary, denying opportunities to many, in economically disadvantaged and thus socially dysfunctional communities, could turn that back on us. The consequent imbalances could undermine liberal democratic society.

Put differently, even opportunity seems open to all (and unfortunately it is not), people don’t enter on the same footing. We often find that people who need to participate in markets. And for that, we need strong communities—to focus on good schools, a safe environment, and informal safety net over the formal safety net, and so on. I also think communities can work well in stimulating political and economic power, creating the competition that democracy and capitalism both need. That, to some extent, the new liberalism we have to discover.

For that, we need to refashion communities in modern times. The book emphasizes “inclusive localization,” which involves empowering communities and bringing economic activity back to them. However, instead of following the traditional idea of the community as self-contained, gated, narrowly focused, and suspicious of outsiders, we need to use the state and markets to make communities more inclusive. That is, we need confident, open places that are protected, if at all, by tiny walls that can be easily traversed.

In the US, you can find a number of areas reinventing themselves in a modern way. In my book, I talk about one in Chicago, Pilsen, which is largely Mexican American but has seen an increasing number of non-Hispanic move in. The area was once devastated by crime and drugs but now is a place where more and more people have revived largely as a result of community effort. It offers a glimpse of the future of our societies.

In such a society, some communities may be largely ethnic, such as Mexican American, or multi-ethnic, with the right engagement, everybody there can have a sense of common identity. The communities will exist within a larger nation. They offer the possibility of having unity with diversity. Somehow we need to think that as possibly longer, that diversity is problematic. I see this identification with the local community as a basis for nationalism, with the nation the primary source of identity. Populist nationalism can be very dangerous if it turns in the wrong direction.

The researchers looked at what managers call a “promote-and-exploit product launch” strategy. Here’s how it works: suppose a product is more valuable to you if your friends also buy it. That makes you likely to tell your social media friends about such apps, prompting more people to purchase them. Companies can capitalize on this network effect to sell their products—be it apps, games, toys, or operating systems—with mathematical precision, according to University of North Carolina’s Nur Sunar, Chicago Booth’s John R. Birge, and Sinit Vitavasiri of Ericsson, the phone maker. It’s even possible for a company to determine whether it should launch a product and to figure out who the optimal buyers are on the basis of their social media friends, the researchers find.

That possibility should appeal to companies, as developing and launching a product that involves collaborative technology can be an expensive, high-stakes undertaking. Software companies, for example, may spend 10–20 percent of revenues on research and development and even more on sales and marketing.

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When financial regulators cooperate, foreign investors benefit

W hen countries have limited regula-
tory oversight and shareholder protections, some investors may steer clear. But if regulators there cooperate and agree to share informa-
tion with global counterparts, that can boost investment, research suggests.

“Our evidence is particularly relevant as regulators and investors consider adopting and expanding information-sharing and cooperation arrangements,” write University of North Carolina’s Mark Lang, Chicago Booth’s Mark G. Maffett, University of Michigan’s James D. Omartian, and University of Utah’s Roger Silvers.

The researchers analyzed the effects of the Multilateral Memorandum of Understanding, a nonbinding agreement between global securities regulators created in the wake of the 9/11 terrorist attacks. More than 100 regulators have signed the MMOU, agreeing to cooperate and share information.

The United States was one of the first countries to sign, in 2002, and in some sense the MMOU gives more influence to the US Securities and Exchange Commission. The SEC’s jurisdiction is largely limited to the US, and its primary mandate is to protect US investors and exchanges. However, the MMOU makes it easier for the SEC to enforce laws that companies cross-listed on a foreign exchange are supposed to follow.

Lang, Maffett, Omartian, and Silvers used data covering $2.2 trillion of investments across 1,232 mutual funds to analyze what happened after each signing country adopted the agree-
ment. Joining the MMOU was good for cross-listed companies, they found, as funds moved money into companies that were subject to increased SEC oversight. This MMOU effect tilted holdings 5 percent toward cross-listed stocks relative to those listed on only a home country’s exchange.

While US investors put 2 percent more into cross-listed stocks, investors outside the US increased their investment 7 percent. “The difference between US funds and non-US funds is significant,” write the researchers.

Large institutional investors outside the US were likely seeking the protections of SEC-style oversight, the researchers surmise, noting that the effects were even stronger after a US Supreme Court decision limited the legal rights of non-US investors in US courts. The researchers consider the fact that non-US investors moved even more into cross-listed stocks after this decision, which limited their ability to pursue private legal action, to be further indication that foreign investors sought the protections of greater oversight.

Moreover, the MMOU led to more investment in securities directly subject to SEC oversight. Investors typically increased their holdings in SEC-registered American depositary receipts, stocks that trade in the US but represent shares in a foreign company. “We find evidence of a significant increase in non-US foreign ownership of SEC-registered ADRs but no evidence of an increase in ownership of non-reg-
istered ADRs,” write the researchers.

Most of the increased holdings occurred on a country’s own stock exchange, however, providing evidence that the additional SEC oversight primarily affected non-US investors’ trading foreign stocks on local exchanges. The MMOU effect was particularly pronounced in countries that were previously had weak eco-

nomic ties to the US and had lacked a working relationship with the SEC.

And the agreement attracted long-term investors, who increased their holdings more than twice as much as short-term investors did.

Prior to the MMOU, the researchers write, regulators in different countries collaborated rarely and with difficulty—and now the International Organization of Securities Commissions is in the process of enhancing the agreement. The research findings suggest that as countries weigh what to do, they should note who benefits from additional investor protections.—Emily Lambert


FOR BETTER NEGOTIATIONS, TRY SHAKING HANDS... ...Or sharing a plate of food to reach a better deal faster

H ere’s a new negotiating tactic: enjoy a family-style meal with your counterpart before making your opening bid. When people in a business negotiation share not just a meal but a plate, they collaborate better and reach deals faster, suggests research by Cornell University’s Katlin Woolley (a graduate of Chicago Booth’s PhD Program) and Booth’s Aydel Fishbach.

Sharing plates is customary in Chinese and Indian cultures, among others. Because the custom requires people to coordinate their physical actions, it might in turn prompt them to coordinate their negotiations, the researchers reasoned.

To find out, they asked study par-
ticipants, all strangers to one another, to pair off in a lab experiment that involved negotiating. The participants were invited to have a snack of chips and salsa with their partners. Half of the pairs received one bowl of chips and one bowl of salsa to share, while the others each had their own bowls.

Next came the negotiation scenario, in which one person in each pair was randomly assigned to act as management and the other as a union representative. Their goal was to arrive at an acceptable wage for the union within 22 rounds of negotiation, with each round representing one day of negotiations, and with a costly union strike scheduled to start in the third round. The costs of the strike accrued quickly for both sides, giving the parties an impetus to reach a mutually agreeable deal quickly.

Teams with shared bowls took nine strike days, on average, to reach a deal, four fewer than pairs that had eaten remotely. “Negotiators were more cooperative, and the parties an impetus to reach a mutually agreeable deal quickly,” write the researchers.

Fishbach says that while technology allows people to conduct meetings remotely, there’s value in getting together over a meal. And the same is true outside of business negotiations. “Basically, every meal that you’re eating alone is a missed opportunity to create that social bond.”—Alice G. Walton

This phenomenon, the researchers write, was unrelated to how two people in a negotiating team felt about each other. Rather, what mattered was how well they coordinated their eating. When Woolley and Fishbach repeated the experiment with both friends and strangers participating, friends arrived at a negotiation agreement faster than strangers did, but sharing plates had a significant effect for both groups. The degree to which a person felt she was collaborating with her partner while eating—sharing food rather than competing for that last bite—predicted her feelings of collaboration during the negotiation phase.

Fishbach says that while technology allows people to conduct meetings remotely, there’s value in getting together over a meal and the same is true outside of business negotiations. “Basically, every meal that you’re eating alone is a missed opportunity to create that social bond.”—Alice G. Walton


Photos: Kattia Pinzon/Ryan加 tagged background.jpg


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This research was supported by grants from the National Science Foundation (SES-1619805), the University of California at Berkeley’s Institute for the Study of Labor, and the University of Berkeley’s Graduate School of Business. The authors thank Mark Maffett, Francesca Gino, and Michael Norton for comments on the initial draft of the paper. The opinions expressed are those of the authors and do not necessarily reflect the views of the National Science Foundation or the University of Berkeley. Descriptions of the research were approved by the University of California at Berkeley’s Committee for Human Research.

People who naturally shake hands are better at resolving conflicts, according to a recent study. People who naturally shake hands at the outset scored significantly higher, the researchers find. People who naturally shake hands could be better at cooperating—but when the researchers randomly assigned people to shake hands, they also saw the effect of shaking on negotiations. At the heart of hand shaking’s effects appears to be a signal of cooperation, which was enhanced for negotiations where working together benefited both parties, but also for negotiations where cooperation tended to hurt one of the two parties.

Buyers who shook hands with the sellers were less likely to lie—even to their own detriment—which made the outcomes more equitable and allowed sellers to do better,” the researchers write. —Alice G. Walton


Artificial intelligence isn’t boosting the economy yet

Even as artificial intelligence crosses unlikely thresholds and spurs stock prices, it isn’t having a discernible effect on the economy. Measured productivity growth has been declining for more than a decade in the United States and abroad. It calls to mind Solow’s paradox, a 1987 observation by the Nobel laureate economist Robert Solow, who noted that one “can see the computer age everywhere but in the productivity statistics.” It shouldn’t be a surprise that the steam technologies that drove the US industrial revolution took nearly 50 years to show up in rising productivity statistics. And the first 25 years after the development of the electric motor and internal combustion engine were associated with a productivity slump, with growth of less than 1.5 percent a year. Then, in 1915, the pace of economic expansion doubled to about 3 percent for 10 years. In these cases, the researchers find signs of what they call “the productivity J-curve,” a period in economic data when productivity growth is underestimated, followed by a period when it’s overestimated. This dynamic may have also applied to the computer-powered information technology era, with 25 years of slow productivity growth followed by a decadelong acceleration, from 1995 through 2005.

Why does this happen? It takes a while for businesses and workers to figure out how to harness innovative new technologies. It also requires investments in intangible developments, including “a fundamental rethinking of the organization of production itself,” the researchers find. “Along with installing more easily measured items like physical equipment and structures capital, firms must create new business processes, develop managerial experience, train workers, patch software and build other intangibles,” the researchers write. The intangible assets associated with bringing out the potential of AI thus aren’t yet showing up in economic data growth, they argue. The productivity J-curve is really an error in measuring total factor productivity (TFP), one of the main elements of GDP, the researchers write. The error results in a initial dip in measured productivity “while the investment rate in unmeasured capital is larger than the investment rate in other types of capital,” they find. Measured productivity then rises “as growing intangible stocks begin to affect measured production.”

Brynjolfsson, Rock, and Syverson developed a model, based on stock-market valuations that capture the magnitude of intangible investment value, to account for this measurement error. They used the model to estimate the value of intangible capital investments and demonstrate how such estimates can be used to infer more-accurate, timelier measures of TFP growth. The economy is early in the AI adoption wave, and corporate investment in AI measured at about $40 billion in 2017. According to the researchers, this implies intangible investments in AI may have accounted for 0.55 percent of “lost” output or output that national productivity statistics didn’t measure— that year.

Brynjolfsson, Rock, and Syverson suggest that investments in AI are likely to grow rapidly and that the US economy may be entering a period when AI will have significant effects on estimates of productivity growth. An arrival of the benefits of intangible investments in AI over the coming decades would need to be anticipated to the point of “a productivity surge,” the researchers find. …

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The productivity J-curve
Researchers find periods of inaccurately measured productivity growth in the wake of major new technologies taking hold.

A history of similar productivity J-curves

1700–1800s
The steam engine
Took nearly 50 years to show up in rising US productivity statistics

1800–1900s
The electric motor, the internal combustion engine
A 25-year productivity slump, with growth of less than 1.5 percent a year, than 10 years at double pace

1970–2005
Computer-powered information technology
Another 25 years of slow growth followed by a decadelong acceleration

The economy is early in the AI adoption wave, and corporate investment in AI measured at about $40 billion in 2017.

GIVING SOME consumers a clean credit slate can hurt others, a study by Amanda Liberan, Princeton’s Christopher Neilon, the Chilean Banking Association’s Luis Ospiz, and Chicago Booth’s Seth Zimmerman. In 2002, Chile’s Congress passed a law ordering credit reporting companies to stop disclosing delinquencies on small loans incurred in prior years. The one-time data wipe affected about 20 percent of the adult population. The goal of the policy was to help mostly lower-income consumers with small default amounts, particularly those affected by a 2001 earthquake.

But the action backfired, according to the research. People whose defaults were deleted from the registry borrowed more after the policy went into effect. Borrowing fell for the 63 percent of consumers who had records as winners could no longer tell these people were better credit risks. Consumer borrowing dropped by 3.5 percent overall.

The policy had the greatest negative effect on lower socioeconomic groups. To understand, after the information was deleted, these profiles most closely resembled those of loan defaulters. Brynjolfsson, Rock, and Syverson suggest that investments in AI are likely to grow rapidly and that the US economy may be entering a period when AI will have significant effects on productivity growth. An arrival of the benefits of intangible investments in AI over the coming decades would need to be anticipated to the point of “a productivity surge,” the researchers find. …

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H ow to Improve School-Choice Systems

Many Large School Districts Have Embraced School Choice in Recent Years. Instead of Assigning Children to Their Neighborhood Schools, Districts Have Tried to Make It Easier for Families to Choose Schools. But Districts with Centralized Admissions Systems Use Different Algorithms, and Some Work Better Than Others, Research Suggests. Some Spur Families to Try to Game the System, According to Princeton’s Adam Kapor and Christopher Neilson and Chicago Booth’s Seth Zimmerman, Who Encourage School Districts to Use What the Researchers See as a Better Alternative. They Studied the High-School Choice of Students in New Haven, Connecticut, Which Has Used a Centralized Admissions System Since at Least 1997. Like Barcelona, Beijing, and Charlotte, North Carolina, New Haven Uses an Algorithm Known as the Boston Mechanism, Which Makes It Easier for Families to Get into Schools Listed First on Their Application. However, If Families Rank a Popular School First, They May Still Have Little Chance of Being Admitted to that School or Any Other Popular School. So the Choice of Which School to List First Becomes Important. Filling out an Application on This Kind of System Requires Families to Know Their Chances of Admission at Each School. But Kapor, Neilson, and Zimmerman Surveyed 417 Families of Rising Ninth Graders in 2015 and 2017 and Find Applicants Did Not Necessarily Know That and So Lacked the Information They Needed to Successfully Navigate the Process. Many Families Ranked Their First-Choice Schools First, But Their Chances of Admission Were Lower Than They Realized. On average, parents thought the chance of getting their child into their first- or second-choice school was 30 percentage points higher than it really was. Others mistakenly believed they would have an easier time getting into a school that they liked but did not think was their neighborhood school and so demoted their first-choice school on the application. Lower-income families were less likely to use accurate strategies than households with higher incomes. While students play strategically and attempt to trade off preference intensity against admissions chances, they do so using mistaken beliefs about admissions chances, the researchers write. The researchers created a model to simulate student preferences and outcomes on the basis of another mechanism for school admissions: deferred acceptance. In this system, families rank schools in order of preference, but each choice is weighted the same and is treated in sequential order. When districts run school choice using deferred acceptance, the best approach is for families to write down the schools they like, in their preference order. This results in better outcomes, given the mistakes families make when confronted with the more complicated Boston mechanism, the researchers conclude. That said, someone assuming that families make no mistakes in the Boston system would conclude the simplification produces worse outcomes, write Kapor, Neilson, and Zimmerman, explaining that this is why it is important, when designing school choice systems, to think about the mistakes families make. “You can convince most people to make the best choices, once you simplify the process,” Zimmerman says.—Alina Dzik

What Causes Stock Market Crashes

The Shanghai Stock Exchange reached a historic peak in June 2015, and then plunged, losing almost 40 percent of its value in a month. This crash of the world’s second-largest stock market evoked comparisons to the 1929 Wall Street collapse, and provided a laboratory for testing an enduring explanation of its causes.

It has long been theorized that the 1929 crash reflected “leverage-induced fires sales,” according to Tsinghua University’s Hao Zhou and Tsinghua University’s Hao Zhou. They acknowledge that the theory has been well-developed to explain how excessive leverage makes investors sell in emergency conditions, accelerating market crashes. But they suggest that, until now, theoretical research has been lacking—and the China crash finally offers empirical evidence. The researchers analyze account-level data for hundreds of thousands of investors in China’s stock market, the latest to see the introduction of margin trading, the researchers write in China. The researchers thus studied the effects of each type of borrowing. According to standard economic theory, investors borrow during good times and put money to work in the stock market, where they expect to earn higher returns than the interest they owe on the loans. Because their debt is secured by the stock and can demand full or partial repayment when stock prices fall, investors can’t or will not choose to use the difference, they have to sell shares to raise funds. This forced selling can cause stock prices to fall further as supply outstrips demand.

On June 12, 2015, the Shanghai Stock Exchange daily index fell to 3,098, its lowest level since May 2009, when it had been 2,000. On that day, China’s government began imposing stricter borrowing rules for brokerage firms. The latter, along with other nonbank lenders such as trust companies, formed the shadow-banking industry in China. The researchers thus studied the effects of each type of borrowing. According to standard economic theory, investors borrow during good times and put money to work in the stock market, where they expect to earn higher returns than the interest they owe on the loans. Because their debt is secured by the stock and can demand full or partial repayment when stock prices fall, investors can’t or will not choose to use the difference, they have to sell shares to raise funds. This forced selling can cause stock prices to fall further as supply outstrips demand.

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The way forecasts are presented can sway voters

Pollsters, take note: there’s a significant difference between the way people perceive forecasts when they’re expressed as a statistical probability and when they’re presented as a percentage-point margin, according to Chicago Booth’s Oleg Umrinsky and Chinese University of Hong Kong’s Luxi Shen, a recent Booth PhD graduate.

Umrinsky and Shen used data provided by the prominent data-driven forecasting organization FiveThirtyEight leading up to the 2016 US presidential election. The researchers presented the then-current forecasts to two groups of study participants, but in different formats. One group saw probability projections that, on average, Democratic candidate Hillary Clinton had a 74 percent chance of winning. The other group saw margin forecasts that, on average, said she would get 53 percent of the vote.

On a given day, both forecasts represented the same snapshot in time—two essentially identical take-ons of Clinton’s expected victory. But participants interpreted them differently. When people saw the probability forecast and were then asked to estimate a margin by which Clinton would win, they overestimated, predicting she would get 60 percent of the vote, more than the 53 percent. Meanwhile, people shown the second, margin forecast predicted the probability of her winning at 60 percent on average rather than the actual 74 percent average.

Both predictions turned out to be incorrect, as Clinton won 48 percent of the vote and lost the election to Republican candidate Donald Trump, who received 46 percent. But they illustrated bias in people’s perceptions. The difference in interpretations is unlikely to be explained by forecasters having the wrong assumptions in their models, the researchers say. In another study, even participants who were given a statistical reasoning problem with all the necessary information to get the right answer showed the same pattern.

“People overestimate margins when shown chance forecasts and underestimate chance forecasts when shown margin forecasts,” the researchers write.

They observe the same phenomenon in sports scenarios. Participants saw predictions for four upcoming professional basketball games, presented either in percentage chance of winning or a point spread. For example, in a National Basketball Association October 2017 match-up, the Golden State Warriors had been given an 84 percent chance of beating the Washington Wizards, or were expected to win by 10 points. Once again, the researchers find that participants either group overestimated what point spreads were expected to be, and those in the margin group underestimated the probability of winning.

This dichotomy extends even to predictions on their convictions. Participants bet more when basketball forecasts were presented as probabilities rather than as margins. This was true for people of all degrees of familiarity with basketball. “A chance (vs. margin) forecast led to higher confidence about the outcome, and this higher confidence was expressed by the willingness to bet more on the game,” write Umrinsky and Shen.

While the bias is unlikely to change major voting decisions, the phenomenon may well affect how people think about investing time and resources in political activism.

“When newspaper readers learn that a gerrymandered district has a 60 percent–40 percent split between voters of two political parties, for example, they may see the district as more competitive than it is,” the researchers write. “Readers may erroneously conclude that gerrymandering has less of an impact on election outcomes than it actually does.” Thus, the researchers suggest, perceptions of the future may depend on the format of forecasts as much as on the forecasts themselves.—Alice G. Walton

What are the chances you have this wrong?

Study participants misinterpreted Hillary Clinton’s chances of winning the 2016 election versus her projected margin of victory.

Given a forecast in this format . . .

Given a forecast in this format . . .

Clinton: 74% chance of winning

Trump: 26% chance of winning

. . . what will Clinton’s percentage share of the vote be?

. . . what is Clinton’s percentage chance of winning?

11 weeks before the election (Aug. 18)

Actual forecast of Clinton’s share: 54%

Participants’ average guess: 64% of the vote

Participants’ average guess: 63% chance

Two weeks before the election (Oct. 24)

Actual forecast: 53%

Average guess: 62% of the vote

Average guess: 62% chance

Actual forecast of Clinton’s chance: 86%

Two days before the election (Nov. 6)

Actual forecast: 52%

Average guess: 58% of the vote

Average guess: 59% chance

Actual forecast: 66%

When Congress increased subsidies, both patients and insurers benefited.

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CORPORATE DIVISIONS TURN POLITICAL

“A lot of what I consider to have gone wrong in American capitalism stems from maximizing shareholder value and that view of corporate purpose. One of the relationships that got strained badly was that between workers and companies. . . Also, the rise of income inequality has eroded social capital and the trust that we have in each other, and has resulted in things like polarized politics, which makes the US government dysfunctional. That is not good for business. It’s not good for an economy if you can’t respond in a timely fashion to changes in markets and changes in technology.”

—STEVEN PEARLSTEIN, technology." Capitalism's columnist, speaking on the Capitalin't podcast

Polarized politics, in things like income inequality and has resulted in each other, capital and the dysfunctions that got strained badly was that between workers and companies. . .


to decisions, they had particip-

take a deception game, in which one player (the sender) had the opportunity to lie to another player (the receiver) in order to achieve a certain outcome for the receiv-
er. In some conditions of the researchers’ study, the senders had an opportunity to tell a paternalistic lie, meaning they had to make an assumption about what type of monetary reward would most benefit the receivers. For example, if a sender told the truth about an unrelated event, such as the outcome of a coin toss, the receiver earned a $10 lottery ticket for that day. If the sender lied, the receiver earned a $30 lottery ticket in three months.

This, says Levine, models a situation in which communicators have to make assumptions about what will most benefit the recipients of their statements—an immediate benefit now or a bigger benefit in the future. A communicator might have to decide whether to give false praise, which provides an immediate benefit, or candor criticism, which is often costly in the near term but beneficial in the long run.

The researchers also included conditions in which the sender had the opportunity to tell an unequivocally prosocial lie, which would clearly benefit the receiver. For example, the sender could lie to earn the receiver two tickets, rather than one, to the $10 lottery. In this situation, no subjective judgment is required because two tickets are clearly preferable to one. The participants who received paternalistic lies reacted negatively on several levels. They viewed the liars as significantly less moral than those who told the truth, as well as less moral than those who told unequivocally prosocial lies. The researchers also find that paternalistic lies adversely affected recipients’ emotional states and their satisfaction with the outcomes of the lies, and caused them to punish the liars.

Participating in the study, participants disapproved of others who told them paternalistic lies, in which the liars’ recipients are sensitive to what liars are acting based on assumptions or true insight into the preferences of the person they’re lying to. Unless you can be sure about another person’s preferences, it may be best to steer clear of even well-intended lies, the researchers conclude. If uncovered, paternalistic lies do more harm than good.—Alcor G. Wolfre

Taking issue with a liar’s good intentions

Study participants disapproved of others who told them paternalistic lies, in which the deceivers made a judgment call about the lie’s potential benefit for the recipients. When liars communicated their good intentions, it did not reliably reduce outcomes of the lies, and caused them to punish the liars.

How participants rated the moral character of another who had decided between telling them the truth and a lie

Truth tellersLiars

Lies

How participants rated the emotional reaction to the experience

Lies

Lupoli, Levine, and Greenberg ran a series of experiments. They had particip-

call about the lie’s potential benefit for the recipient. An oncologist who doesn’t actually know a patient’s wishes regarding candor might tell a paternalistic lie by sugarcoating the prognosis, for example. Because of the assumption on the part of the liar, the lie is considered paternalistic rather than unequivocally prosocial—the lie would be the latter if it were known to align with the patient’s preferences. In this example, the doctor’s lie would be unequivocally prosocial only if the patient had previously made clear that the doctor should soften the blow of any unpleasant developments.

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When little white lies cause big hurt

M ost people have, at one point or another, told a well-intentioned lie to spare another’s feelings or to bolster someone’s confidence. But even lies that are intended to serve the greater good can backfire, inciting suspicion about the liar’s intentions and morality, according to Deakin University’s Matthew Lupoli, Chicago Booth’s Emma Levine, and Bocconi University’s Adam Eric Greenberg.

The researchers set out to better understand a previously undefined variety of lie, which they dub “paternalistic.” In this type of lie, the deceiver makes a judgment
A big financial institutions such as Lehman Brothers fell into distress in 2008, a credit contagion spread through the financial industry and economy, as lenders retrenched and hoarded capital. It has been less clear how credit contagion can spread through other industries, but research by George Washington’s Serena Ajca, Georgetown’s Volodymyr Babich, Chicago Booth’s John R. Birge, and City University of Washington’s Abhijit Banerjee examined daily changes in credit default swap (CDS) spreads for all contracts with a five-year maturity between 2003 and 2004. A CDS is a derivative contract guaranteeing the owner a payout in the event that the borrower defaults. The contract’s price is known as the spread, which is the cost to insure against the default of 100 of the issuer’s debt.

### Business relationships can be a drag on companies’ credit

When CDS spreads linked to Ford’s debt widened during a rough period, a major supplier’s spreads moved in sync. Business relationships can be a drag on companies’ credit. The researchers find. It makes sense that if Ford was slashing spending, its suppliers would have been suffering, they note. But by contrast, CDS spreads were unchanged for companies with no relationship to either Ford or American Axle, such as semiconductor manufacturer Advanced Micro Devices. This suggests that the mechanism by which contagion spreads is based on quantifiable business relationships, the researchers find.

They calculate that top-tier suppliers to companies experiencing negative credit events suffered widening spreads amounting to 44 to 71 basis points, or 0.44 to 0.71 percentage points. CDS spreads for second- and third-tier suppliers also widened, suggesting that “CDS markets pay close attention to supply chains, both to first and higher tiers,” the researchers write.

### Key Insight

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Blockchain could improve corporate auditing

When politicians know their performance will be assessed and publicized, they are more motivated to meet the needs of their constituents, research suggests. In a randomized experiment in poor areas of Delhi, India, some ward councillors received letters informing them of their area’s development expenditure breakdown would appear in a local newspaper a month before the next election. Those officials shifted their spending priorities to better meet the needs of their constituents. They were also more likely to be given an electoral ticket by their party, and they won more votes at the ballot box.

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Chana R. Schoenberger

“Blockchain’s weakest links,” Fall 2018.

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Chana R. Schoenberger

“Blockchain’s weakest links,” Fall 2018.

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Who benefits most from productivity growth?

When big cities experience an economic boom, you expect an upsurge in wages and growth in those areas. But there’s some nuance: according to Chicago Booth’s Richard Hornbeck and University of California at Berkeley’s Enrico Moretti, one area’s surge particularly benefits low-skilled workers locally—and high-skilled workers elsewhere.

Using total factor productivity (TFP) as a measure of local productivity growth, Hornbeck and Moretti analyzed two decades of data from major US cities to quantify the direct effects on people living in booming cities and the indirect effects on people elsewhere. Allowing for trade-offs between salary and cost-of-living increases, the researchers find that low-skilled workers gained the most from local productivity growth.

But gains extended further afield: a boom in San Diego or Los Angeles, say, was also felt in other cities. And high-skilled workers gained more from productivity growth in other cities.

The data Hornbeck and Moretti analyzed, spanning 1980 to 2000, focused on cities that experienced higher productivity growth because of a concentration of rapidly innovating industries, compared with cities that had a concentration in industries with less growth. “Our main result is that local productivity growth does seem to be delivering sizeable and similar gains to higher- and lower-skilled workers, of roughly 0.5 to 0.6 percent year-over-year,” Hornbeck says. “Locally, in the cities experiencing major growth, some of these benefits are lost to increases in the cost of living as people crowd in from elsewhere. But across the nation, increases in living costs in particular cities are felt in other cities. And high-skilled workers gained more from productivity growth in other cities.

Locally, lower-skilled workers benefited more

When a city started booming, there was a greater impact on nominal earnings and purchasing power for high-school graduates than for college graduates, which suggests that local productivity growth acted to compress local income inequality.

One intense productivity surge: San Jose, California

Silicon Valley’s rise as a tech hub lured hundreds of thousands of workers away from other US cities. The researchers calculate that the San Jose metro area experienced TFP growth of 18.4 percent over 1980–90.

Workers lost by each metro area because of San Jose’s productivity growth


<table>
<thead>
<tr>
<th>City</th>
<th>Workers lost</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Jose</td>
<td>76,376</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>25,733</td>
</tr>
<tr>
<td>San Diego</td>
<td>25,733</td>
</tr>
<tr>
<td>Chicago</td>
<td>8,301</td>
</tr>
<tr>
<td>Miami</td>
<td>4,150</td>
</tr>
<tr>
<td>Washington, DC</td>
<td>3,154</td>
</tr>
<tr>
<td>Phoenix</td>
<td>6,807</td>
</tr>
<tr>
<td>Denver</td>
<td>2,158</td>
</tr>
<tr>
<td>Dallas</td>
<td>2,548</td>
</tr>
<tr>
<td>Seattle</td>
<td>2,988</td>
</tr>
<tr>
<td>Atlanta</td>
<td>2,158</td>
</tr>
<tr>
<td>Houston</td>
<td>2,158</td>
</tr>
<tr>
<td>New York City</td>
<td>1,328</td>
</tr>
<tr>
<td>Portland</td>
<td>1,328</td>
</tr>
<tr>
<td>Phoenix</td>
<td>6,807</td>
</tr>
<tr>
<td>Seattle</td>
<td>2,988</td>
</tr>
<tr>
<td>San Francisco</td>
<td>7,637</td>
</tr>
</tbody>
</table>

San Jose’s productivity growth led to an addition of 361,765 workers over 1980–2000 . . .

One city’s productivity boost indirectly helped other cities

While boomtowns lured highly skilled workers from other cities, those who stayed behind still enjoyed wage increases because such workers were scarcer. Further, in the cities that people were leaving, the cost of living declined. For renters, this was good news, as it translated to lower costs.

In a city that had a productivity surge

<table>
<thead>
<tr>
<th>Earnings</th>
<th>Cost of rent</th>
<th>Renters’ purchasing power</th>
</tr>
</thead>
<tbody>
<tr>
<td>+$1,000</td>
<td>$0</td>
<td>$2,731</td>
</tr>
<tr>
<td>+$2,000</td>
<td>$2,000</td>
<td>$4,367</td>
</tr>
<tr>
<td>+$3,000</td>
<td>$4,000</td>
<td>$6,000</td>
</tr>
<tr>
<td>+$4,000</td>
<td>$6,000</td>
<td>$7,731</td>
</tr>
</tbody>
</table>

In other US cities

<table>
<thead>
<tr>
<th>Earnings</th>
<th>Cost of rent</th>
<th>Renters’ purchasing power</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0</td>
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<td>$6,000</td>
<td>$7,731</td>
</tr>
</tbody>
</table>

Demand for college-educated workers remained high both in boomtowns and elsewhere.

When a city’s productivity surged, the cost of living went up locally but down elsewhere.

Boombtowns’ higher wages did not go as far locally, while other cities benefited more.
Most economists agree on how to tackle climate change. Can politicians make it happen?

BY MICHAEL MAIELLO AND NATASHA GURAL
ILLUSTRATIONS BY KELSEY DAKE
t was, perhaps, the closest that the economics profession has ever come to a consensus. In January, 43 of the world’s most eminent economists signed a statement published in the Wall Street Journal calling for a US carbon tax. The list included 27 Nobel laureates, four former chairs of the Federal Reserve, and nearly every former chair of the Council of Economic Advisers since the 1970s, both Republican and Democratic. “By correcting a well-known market failure, a carbon tax will send a powerful price signal that harnesses the invisible hand of the marketplace to steer economic actors towards a low-carbon future,” the economists noted. All revenue from the tax should be paid in equal lump-sum rebates directly to US citizens, they added.

Not all economists agree that the tax should be revenue neutral in this way, but the profession has been coalescing in recent years around the idea of a carbon tax. Most prefer such a tax to the most prominent alternative policy for tackling carbon emissions, cap and trade, according to a recent poll of expert economists. (For more on that poll, see “What’s the best policy for combating climate change?”)

But a carbon tax seems to be a political nonstarter in the United States. The bipartisan call for action from economists over the years has been echoed by a failure to act by presidents from both parties. President Donald Trump denies the need to confront man-made climate change. But although Barack Obama, his predecessor, in 2015 called putting a price on carbon “the most elegant way” to fight global warming, he did not come out in favor of carbon tax,” Yale’s William D. Nordhaus told the Chicago Booth Review. Obama was when he was president is that he did not come out in favor of carbon tax.” Yale’s William D. Nordhaus told the New York Times last October, days after winning the 2018 Nobel Prize in Economic Sciences for his work on economic modeling and climate change. US states have shown that they, too, can reject a carbon tax. Even in heavily Democratic Washington state, voters last year rejected (for the second time) a proposal to tax carbon dioxide emissions. The New York Times published an opinion column in December by one of its former environmental reporters titled “Forget the Carbon Tax for Now,” calling it politically toxic. Days later, Paul Krugman, a Times columnist and 2008 Nobel laureate, wrote that he too had concluded there was no near-term political support for such a tax.

In terms of confronting climate change, the US is a laggard. Twenty-six countries and provinces have implemented some form of carbon tax, according to the World Bank, and there are another 25 emissions-trading systems. In Canada, Prime Minister Justin Trudeau is leading a charge to introduce a federal carbon tax and bring carbon pricing to provinces and territories that don’t already have a pricing system in place.

To its proponents, a carbon tax is simple and clearly beneficial. It would account for the costs of pollution that aren’t already priced into what people pay at the pump for fuel cars, send to the electric company to power homes, or offer up daily to Amazon to have items shipped. Releasing carbon dioxide into the atmosphere is heating the planet, melting glaciers, and changing the Earth’s weather patterns. These emissions cause long-term damage that could destroy the environment as we know it, and, the argument goes, a tax would give businesses, governments, and households an incentive to reduce and ultimately eliminate them.

Many believe the need for action is urgent. According to the US National Oceanic and Atmospheric Administration, carbon stored in the Earth’s atmosphere is at its highest levels in 800,000 years. The effects of the warming atmosphere will be felt more quickly than anticipated, a UN scientific panel concluded last October, saying that without a global carbon tax, any temperature target will be exponentially harder to meet. However, does a tax, arguably the best economic tool that exists for addressing climate change, have any possibility of ever being implemented widely? And if not through a carbon tax, how should we put a price on carbon?

The cost of carbon
Economists generally believe that we, as current users of fossil fuels (heating and air conditioning our homes, driving to work), have gotten a free ride for too long because the price we pay at the pump, however high it may seem, accounts only for the costs of extracting and refining the oil, plus profit and overhead for the company selling it. We’re not paying for the costs that come later, in the form of harm to future generations—rising sea levels, destructive heat and erratic weather patterns, and social and political turmoil. The market hasn’t accounted for these “external” costs because they are not embedded in the prices of the carbon intensive goods we produce and consume today. As a result, we ignore those costs, carbon emissions are high, and the burden falls on others down the road.

This puts democracies in a particular political pickle. When a commuter burns a tank of gas and belches exhaust, the brunt of the bill is passed to future generations. The same is true for people who fly in planes, or leave their lights or appliances switched on, using electricity often supplied by burning coal. The free ride has gone on for so long, how can anyone convince the current generation of consumers, many of whom are skeptical that the government’s role should be expanded, that the bill should land on them?

Carbon emissions create an economic externality, when the costs of an economic activity are borne by neither the producer nor the consumer. Economists would have us measure the cost of the externality and add it to the price of the good. If producing plastic coffee pods releases carbon dioxide into the atmosphere, for example, the price of pods at the grocery store would reflect that. The idea is that adding to the costs of pollution will eventually reduce pollution, as businesses and consumers find money-saving alternatives.

However, the amount today’s consumers should pay for tomorrow’s problems is far from settled science. Nordhaus, one of the first economists to consider the role that climate in economic growth, pioneered a climate-change model that estimates the social cost of carbon emissions and has become something of an industry standard. (See “The most important number you’ve never heard of,” page 33.) But models involve various discount rates and significant assumptions, yielding vastly different estimates, and there’s disagreement about whether or not to attempt to include costs associated with unknown but potentially catastrophic events caused by climate change, such as reduced biodiversity or even war. Should carbon be priced at $30 a ton, or $300? Whatever it is determined to be, it could be added to the cost of oil when it’s purchased by the barrelful, natural gas when it’s fed to its burners, or appliances switched off. The cost of carbon is then passed to future generations. The same is true for people who fly in planes, or leave their lights or appliances switched on, using electricity often supplied by burning coal.

When a commuter burns a tank of gas and belches exhaust, the brunt of the bill is passed to future generations. The same is true for people who fly in planes, or leave their lights or appliances switched on, using electricity often supplied by burning coal.
A tax on carbon is meant to impose costs on carbon usage that the market price doesn’t capture, effectively increasing the price of a barrel of oil or a ton of gasoline to account for future environmental and health damages. But what is the price of carbon? That, according to the University of Chicago’s Michael Greenstone, is “the most important number you’ve never heard of.” And it is up for debate.

The notion that pollutants should bear the public health and environmental costs of their activities was pioneered by Yale’s William D. Nordhaus, who received the Nobel Prize in Economic Sciences in 2018. Nordhaus developed a model to estimate the social cost of carbon, which is the present value of the net harm caused by every ton of carbon dioxide released into the atmosphere. This cost can be used to establish policies, such as the rate for a carbon tax. But it can also be used to set electricity rates, emissions caps, federal land leases, energy subsidies, and more. In the United States, the government started using a single social cost of carbon during former President Barack Obama’s administration. Determining this value involves considerable uncertainty, however, it is dependent on the details of how the figure is calculated. Various US government agencies were using different costs until Greenstone and other researchers formed an interagency working group to establish a single federal value. After updates, that settled near $50 per 2020 in current dollars. The Trump administration has since disbanding the working group, and it changed assumptions in its model, so that the social cost of carbon it recognizes falls to almost zero.

One detail in the calculation is the discount rate. Whatever the number, any dollar spent today to mitigate environmental damage would presumably be worth more 100 years from now, when the environmental benefits of using less carbon are realized. That’s why, when trying to determine the social cost of carbon in today’s dollars, economists need to apply a discount rate, as business do when they evaluate projects based on discounted-cash-flow analysis. The lower the discount rate applied, the higher the overall social cost of carbon. Under Obama, the government used a range of discount rates, from 2.5 to 5 percent, tending toward the lower end of the spectrum. The Trump administration uses a higher range, 3–7 percent.

Yale’s Stefano Giglio, Harvard’s Matteo Maggioni, and New York University’s Johannes Strobel studied discount rates independently of climate change—by studying the housing markets in the United Kingdom and Singapore, where homes can be purchased outright or leased for contracts lasting 50 to 999 years—and conclude that over very long time periods (a century or more), the rates are extremely low, lower than implied by most economic theory. (See “How much should we pay to mitigate climate change?” Fall 2016.) There’s increasing consensus among econometricians that the discount rate between 2 and 3 percent, says NYU’s Peter Howard.

A bigger issue in calculations, he says, is that difficult-to-measure events and impacts, such as some nonmarket damages, socially contingent damages, and systematic changes to the climate are missing from the models. There’s generally scientific agreement about how climate change will affect future temperatures and precipitation, but it’s harder to predict how it will change things such as storms, monsoon seasons, ocean patterns, biodiversity and habitat loss, local water systems, recreational goods and services, and so on. The harder it is to model such aspects, the more likely it is that they’ll be excluded from economic models of climate change. Because of this, he says, potential catastrophic impacts and tipping points have been largely ignored in standard models that determine a social cost of carbon.

And should the models at least reflect the risk of such scenarios occurring, as well as the amount of risk we’re willing to take that potentially irreversible environmental and societal changes might occur? Beyond that, the US, like other governments, has primarily focused on calculating a domestic social cost of carbon, considering only costs to the US. But the effects of climate change aren’t contained by country borders.

The University of Chicago hosts and coleads the Climate Impact Lab, where Greenstone and academics from several institutions are working on calculating a global social cost of carbon. That could be based on detailed localized data on sea-level rise, temperature, precipitation, and heat-related deaths; projections related to climate and social welfare; and empirically-based projections. When established, the global value could be fed into energy and climate policies worldwide. It will also be used to create a breakdown map that will show localized effects of climate change.

“One are a list of reasons to believe the current estimates are more of a lower bound,” Howard says of today’s carbon-cost estimates. “As we gain more information, and new research is integrated into the best models, I expect that the social cost of carbon will increase.”
A long way to go

More than 50 national and regional programs worldwide address only a small fraction of global carbon emissions.

Share of annual greenhouse emissions covered by every known carbon tax and emissions-trading system in the world

Based on global emissions in 2012

<table>
<thead>
<tr>
<th>Emissions not covered</th>
<th>Covered by emissions-trading systems</th>
<th>Covered by carbon taxes</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>90%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>80%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>70%</td>
<td>15%</td>
<td>15%</td>
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<td>60%</td>
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<td>45%</td>
<td>45%</td>
</tr>
<tr>
<td>0%</td>
<td>50%</td>
<td>50%</td>
</tr>
</tbody>
</table>

World Bank Group, 2018

Topel says that there are groups that don’t trust that markets, even if armed with better-balanced incentives, would solve the problem of climate change. They would still push for more government involvement in the market in the form of regulation, and perhaps also subsidies and investment in green-energy research.

by reducing income or other taxes by an equivalent amount, which he says would prevent the government from growing while reducing distortions in economic incentives. Other versions of this idea might return revenue in the form of payroll taxes, or by eliminating regulations and taxes on industries that rely less on fossil fuels and have a smaller carbon footprint. British Columbia’s carbon tax is accompanied by personal income tax cuts and an income tax credit for low- and moderate-income families.

The only problem? Topel doesn’t think the US voting public would trust elected officials to follow through on that proposal—as many people have different ideas about what to do with revenue raised from a tax, and the government cannot commit to maintaining lower taxes. Consider the National Resources Defense Council’s view of a carbon tax. “While a carbon tax can be an important part of a comprehensive program to cut our carbon footprint and to hold polluters accountable, it must be accompanied by strong limits on carbon emissions, including those under existing authority granted by the Clean Air Act and all other existing legal tools,” says a spokesperson in a statement.

Topel sees this as evidence of groups not trusting that markets, even if armed with better-balanced incentives, would solve the problem of climate change. They would still push for more government involvement in the market in the form of regulation, and perhaps also subsidies and investment in green-energy research.

“Just about all of us agree a carbon tax can’t stand alone; it has to be part of a suite of policies,” explains the Carbon Tax Center’s Charles Komanoff, an environmental activist who says US carbon-tax advocates including him are focusing in 2019 on persuading members of Congress to include a carbon tax in any Green New Deal they propose. “A carbon tax is going to be passed only when there is a strong Democratic majority in Congress and a Democratic president, and the Democratic majority is going to insist on investing some of the carbon tax revenues to transition to a lower-carbon economy. The window has closed on an era when we might have been able to pass a pure carbon tax. I don’t see that window opening again for a long time.”

The only hope for securing voter support for a carbon tax may be to focus on the almighty dollar, says University of Chicago’s David A. Weisbach. People should be attracted to the amount of revenue a carbon tax could raise over the course of a decade, not just climate-change benefits. If the tax raises $1 trillion, that would move the economy in a more environmentally responsible direction and fund any number of value-improving projects. “You can do good stuff with that money,” he says. Topel counters: “To many, that’s the problem.”

Alternative 1: Cap and trade

Voters, even in the US, may yet come around to supporting carbon taxes. Among the surveys suggesting that Americans have an appetite for confronting climate change, one conducted in November 2018 finds that 70 percent of Americans believe climate change is happening. Moreover, 49 percent of respondents said they would support a carbon tax if the revenues were rebated to households, and 67 percent said they would support...
number of pollution permits, creating a market for permits and establishing a market-based cost. The US used such a system to reduce the pollutants that cause acid rain. An attempt to set up a nationwide cap-and-trade system for carbon was proposed but failed to become law during the Obama presidency.

“The problem with such cap-and-trade programs is that they, in essence, give the revenue from a Pigovian tax lump sum to a regulated entity. Why should an electric utility, for example, be given a valuable resource simply because it has for years polluted the environment? That does not strike me as equitable,” wrote Harvard’s N. Gregory Mankiw in 2009. He says he still supports that position, seeing cap and trade as less desirable. “Of course, cap-and-trade systems are better than heavy-handed regulatory systems, but they are not as desirable, in my view, as Pigovian taxes coupled with reductions in other taxes.”

But, if properly designed, either cap-and-trade or a carbon tax could work well, although the outcomes depend greatly on details, write Goulder and Schlenk. “The performance of the two approaches depends critically on specifics of design. Indeed, the design of the instrument may be as important as the choice between the two instruments.” They also suggest countries could pursue a hybrid policy that combines the cap-and-trade approach with a price floor, price ceiling, or both, to reduce volatility.

Richard L. Sandor, CEO of Environmental Financial Products, which helps set up cap-and-trade systems worldwide, says that while academic economists can prove the superiority of either method, he sees emissions trading as the preferred way to proceed. “I just don’t get it because sulfur dioxide proved the case,” he says, adding that the program to reduce S02 cost $2 billion at most to implement and has led to $120 billion in benefits, including reduced medical expenses associated with lung disease. “The program reduced emissions by 90 percent below 1990 levels. In my experience, as a practitioner, that’s a far superior result compared to a tax. I believe that cap and trade allows for the achievement of reductions at the lowest possible price.”

Cap-and-trade programs are running in California, the northeastern and mid-Atlantic US, the EU, and, most recently, China. The EU’s cap-and-trade program for carbon has seen significant variability in terms of permit prices, and the rollout of its second trading period coincided with the 2008-09 financial crisis, which helped depress emissions and prices. If permit prices are low, some see it as an indication that emissions caps were too lax, less stringent than what most cost-benefit analyses would recommend. However, says Goulder, the low prices reveal both a weakness and a strength of the EU system, the strength being “it shows that the [emissions] cap could be met at relatively low cost.” Also, a tax establishes a more certain price signal for households or companies making long-term decisions—but cap and trade creates more-predictable emissions reductions.

China in 2017 launched a carbon market that is expected to become the world’s largest carbon-trading program.
PUT A PRICE ON CARBON, ALREADY

We asked experts: What’s the most effective step governments should take to combat climate change?

**Thomas Sterner,** University of Gothenburg

The most important requirement of any measure is that there must be a cost to emitting carbon, some reasonably high price of carbon. This, in turn, is most easily achieved by carbon taxes, but if these are resisted, there are alternatives, including fuel and dividend systems, or cap and trade. Additional instruments may be subsidies for new green technologies.

This is a difficult issue, one of the difficult issues of this century. It really is of enormous importance that we get something that works and set a high price for carbon soon. It’s a second-order issue, which method we use, would I go for any that works. A carbon tax is most efficient, but that doesn’t matter that much.

**Thomas Covert,** Chicago Booth

Putting a price on carbon. If we were in a world where everybody agreed we should do this, we’d be reasonable to debate how, because there’s enough controversy on that front, some people who would like to see movement [in climate-change policy] would be happy to see anything rather than nothing. I’m somewhat in the tax camp. I think the certainty in a tax, relative to a cap-and-trade system, would be happy to see anything rather than nothing. It’s not going to have a great enough effect to slow climate change.

**Robert H. Topel,** Chicago Booth

They [policy makers] should keep their powder dry. The Kyoto, Paris, and Copenhagen Agreements are all full of fluff. There’s no binding commitment by any country that comes out of those meetings and alleged agreements. And everybody’s got the incentive to not act. They incur all the costs and don’t get any of the benefits of their own actions. We’ve been doing this for the past 25 years, and we’re not really getting anywhere; we just congratulate each other after a meeting. My pessimistic view is to get ready because some part of our response to this problem ought to be adaptation or accommodation. I don’t want this to sound like I’m being sanguine, but one of the things you learn as an economist is that we have a tendency to underestimate the ability of people to adjust and substitute and innovate in the face of changing circumstances. We need a diversified portfolio of approaches. We should be prepared for circumstances that might not have appeared so necessarily be so great, but it’s going to be the hand that the world is dealt.

**Martin Weitzman,** Harvard

Economists’ unanimous response to combating climate change: put a uniform price on carbon. Advantages of carbon pricing: it’s decentralized and cost-effective. The automatic filtering out of high-cost technologies and filtering in of low-cost technologies stimulates investment in carbon-light technologies, discourages investment in carbon-heavy technologies, and produces total emissions at the least cost.) One uniform carbon price can replace un雇主 intrusive, inefficient, overlapping or underlapping, crazy-quilt patterns of command-and-control regulations.

Carbon price raises significant government revenues for direct-dividend rebate to citizens, or for easing other tax burdens, or for lowering the deficit, or for whatever else is deemed worthy.

**Peter Howard,** New York University

It’s a carbon tax. Any economist will say we really need a price signal on carbon pollution. My colleagues and I have surveyed economists on this issue, and the answer is always to put a price on carbon. With a carbon tax, we don’t have to think about the cheapest method to reduce emissions—the market will just find it. Another advantage of a tax is that it can be easily adjusted. If we learn from new research that the cost of carbon should be higher, we can ramp up the carbon tax to account for that.

Unlike the EU’s cap-and-trade system, which starts with the premise of capping emissions on the basis of historical levels, China’s system is “rate-based” and so will allocate emissions allowances according to a variety of benchmark emission-output ratios. In a 2018 paper, Gollek and Richard D. Morgenstern, of the nonprofit research institution Resources for the Future, called China’s adoption of a carbon-trading system “a major step for climate change policy” that “could encourage carbon pricing policies elsewhere.” However, they write that the success of the program in reducing emissions will depend fundamentally on the details of how the Chinese government calculates allowable emissions. “Internationally, much is riding on this program,” they write. “If successful, it could serve as a positive model and encourage other nations’ climate policy efforts. Failure could impede the adoption of emissions trading programs in many parts of the world.”

**Alternative 2: Green technology**

If neither a tax nor a trading system succeeds, it could mean the climate future depends largely on fossil-fuel alternatives and new technologies becoming cheaper to use and more competitive. This is happening—somewhat.

The cost of solar panels dropped 85 percent between 2010 and 2018, as China’s manufacturers entered into (and flooded) the market, reports solar photovoltaic research company PVInsights, while the cost of battery storage has dropped 82 percent, according to Bloomberg New Energy Finance.

Thanks to falling battery prices, electric-vehicle adoption worldwide will increase substantially between 2025 and 2030, Jeffrey Osborne, an analyst at Cowen Inc., has predicted. A 2017 report from Cowen says battery cost declines and carbon dioxide restrictions will make internal combustion engines more expensive and playable in funding R&D in partnership with the private sector as well as creating the regulatory framework and parameters to encourage competition, allowing the market to separate winners from losers rather than mandating a certain technology,” Osborne writes in the report. Add to this list advances in agriculture, urban planning with networked “smart” technologies, and more-efficient robots.

Subsidies, essentially the flip side of a tax, can be used to create incentives and help make wind, solar, and other renewable energies cheaper and more competitive compared with gas and coal. “It’s smart to start by subsidizing new technology,” argues Sterner, who says subsidies can help pay the way for a tax, as it makes it harder for opponents to claim there are no alternatives to fossil fuels. Germany was the first country to subsidize green technology on a large scale and was followed by China, whose subsidy of its solar industry drove down world prices 80 percent between 2008 and 2013—and caused the collapse of solar stocks in the US and Europe. Sterner concedes subsidies can be disruptive but says they also speed up a perhaps-inevitable technological transition. “Time is of the essence here. We’re in a hurry to get rid of carbon emissions.”

But ultimately, much depends on the price of fossil fuels, which are cheap and abundant. In a sign of its commitment to fossil fuels, the Trump administration has been pushing to approve exploration for oil in Alaska’s Arctic National Wildlife Refuge, which was formerly off-limits but could begin producing oil within a decade.

“If the past 35 years is any guide, not only should we not expect to run out of fossil fuels any time soon, we should not expect to have less fossil fuels in the future than we do now. In short, the world is likely to be awash in fossil fuels for decades and perhaps even centuries to come,” write Chicago Booth’s Thomas Covert, University of Chicago’s Greenstone, and MIT’s Christopher R. Knittel in a 2016 study. They find, among other things, that at a then-current battery cost of $325 per kWh, “the price of oil would need to exceed $1350 per barrel before the electric vehicle was cheaper to operate.”

Covert warns that the technology to extract fossil fuels is also improving, perhaps as fast as battery and solar technology is. Fossil fuels got even cheaper with the development of fracking and filtering in of low-cost technologies stimulates investment in carbon-light technologies, discourages investment in carbon-heavy technologies, and produces total emissions at the least cost.) One uniform carbon price can replace un雇主 intrusive, inefficient, overlapping or underlapping, crazy-quilt patterns of command-and-control regulations.

**Peter Howard,** New York University

It’s a carbon tax. Any economist will say we really need a price signal on carbon pollution. My colleagues and I have surveyed economists on this issue, and the answer is always to put a price on carbon. With a carbon tax, we don’t have to think about the cheapest method to reduce emissions—the market will just find it. Another advantage of a tax is that it can be easily adjusted. If we learn from new research that the cost of carbon should be higher, we can ramp up the carbon tax to account for that.

Ultimately, much depends on the price of fossil fuels, which are cheap and abundant…. And the technology to extract fossil fuels is improving, perhaps as fast as battery and solar technology is.
Why less regulation isn’t necessarily better

The longstanding debate about government oversight is giving way to a new understanding of how to craft more effective industry rules

BY BRIAN WALLHEIMER  ILLUSTRATIONS BY MATT CHASE
The US Congress witnessed an increasingly rare moment of bipartisanship last May, when 33 Democratic members of the House of Representatives and 17 Democratic senators crossed the aisle to support rolling back Dodd-Frank Act regulations on small- and medium-sized banks. The vote was one sign that the United States is in a new era of deregulation, nine years after the passage of Dodd-Frank, which was tailored to fit a country reeling from the 2008–09 financial crisis, for which the blame was laid mostly at the feet of the banking industry.

Political gridlock in Washington may slow the deregulation process, but the momentum is already established. Since Donald Trump became president in 2017, the Environmental Protection Agency has loosened standards for the coal industry and weakened Obama-era vehicle fuel-economy rules. The administration has eased restrictions in health and education. New Supreme Court Justice Brett Kavanaugh is on record opposing the Consumer Financial Protection Bureau, an agency the president and many other Republicans have railed against.

"After the crisis, the sentiment in the country was definitely more proregulation," says Chicago Booth’s Christian Leuz, “Trump saying ‘We’re going to roll back Dodd-Frank, or parts of it’ and the debate over the Consumer Protection Bureau have shown that we’re now going in the other direction. So the question has shifted. Now we are asking, ‘Did we overreach? Is there too much regulation?’

This back-and-forth between regulation and deregulation is a hallmark of US financial history. Financial collapses and scandals often usher in demands for new regulation. The 1933 Glass-Steagall provisions, which separated commercial and investment banking, followed the 1929 Wall Street Crash. The 2002 Sarbanes-Oxley Act was a reaction to the Enron and WorldCom scandals. Dodd-Frank was enacted in 2010, following the 2008 financial meltdown.

But while the regulatory pendulum swings again, researchers are arguing in favor of a new paradigm. While some famous economists have long pushed for the kind of deregulation now being implemented, other researchers are finding that regulation can in some cases bring significant benefits, such as improved market competition. Their work is creating a new understanding of the thorny issue.

When regulation works

Deregulation was pioneered by the Chicago School of economists, including the late University of Chicago economists George J. Stigler, Milton Friedman, and Gary S. Becker. Now research is recognizing and describing complexity and subtlety in the relationship between regulation and outcomes.

For example, more stringent securities regulation can increase households’ willingness to invest in equity markets, according to Chicago Booth’s Hans B. Christensen and Mark G. Maffett and Booth PhD candidate Lauren Vollon. Analyzing data from the 31 member states of the European Economic Area from 2000 to 2013, the researchers find that two separate directives aimed at both cracking down on insider trading and market manipulation and enhancing consumer protections in the financial-services industry prompted households to increase their average equity ownership by 12 percent for one directive and 5 percent for the other. (See “Want households to invest more in stocks? Strengthen regulation,” Winter 2017.)

In the run up to the 1960s, the conventional wisdom among scholars and policy makers was that if there was a problem in a market, government regulation could fix it. Economists assumed, as everyone else did, that the solutions put in place through their new laws had their desired effect. Over-the-counter (OTC) stocks can attract more liquidity if their issuing companies are mandated to file disclosures with regulators, publish information in a recognized securities manual, are headquartered in states with stricter merit reviews, and are in higher-level Pink Sheets information tiers, find Humboldt University’s Ulrich Brüggemann, University of Alberta’s Aditya Kaul, Chicago Booth’s Christian Leuz, and Ohio State’s Ingrid M. Werner. (See “On OTC markets, lowering the bar for regulation lowers market quality,” Fall 2016.)

Making private companies report their full financial statements can create more competitive markets, according to an analysis of EU countries by Columbia’s Matthias Breuer, a graduate of Chicago Booth’s PhD Program. The requirement drove more companies to open (and to close), reduced market concentration, and lowered barriers to going public, Breuer finds, although he also notes that it did not make markets more efficient in terms of resource allocation. (See “The benefits, and limits, of financial reporting regulation,” Spring 2008.)

Dodd-Frank itself helps to improve worker safety, according to research by Christensen, Maffett, University of California at San Diego’s Eric Lloyd, and Booth PhD candidate Lisa Yao Liu. The law requires all mine-owning public companies to report mining-related injuries and safety citations on their annual SEC 10-K and quarterly 10-Q disclosure forms, and to issue 8-K filings when they receive “imminent danger orders,” following serious safety breaches. These additional reports led to an approximately 11 percent decrease in mine-safety citations and a 13 percent drop in mining injuries in the roughly three years after Dodd-Frank went into effect, the researchers find. (See “Is Dodd-Frank an instrument of social change?” Published online, July 2016.)

This evidence is helping to shape a new debate, which centers on how to make regulation better rather than eliminating it entirely. “People’s views have become a lot more nuanced. We have come to realize that there are limits to markets’ ability to find solutions to first-order incentive or information problems. The potential market solutions to these problems again suffer from information and incentive problems, making market solutions imperfect too,” says Leuz.

Stanford’s John H. Cochrane, who is also a distinguished senior fellow at Chicago Booth, believes there should be significantly less regulation but also says it has its place, as long as it’s well crafted and delivers the intended results. “We’re in a moment of regulatory reform—there’s no denying that—both from the administration and from Congress,” Cochrane says. “The fact is, we just need better regulation, which includes the process by which regulation is made, rather than just more or fewer rules.”
A shift in thinking

This represents a significant change, as the Chicago School’s influence has prevailed for decades. In the run-up to the 1960s, the conventional wisdom among scholars and policy makers was that if there was a problem in a market, government regulation could fix it. Economists assumed, as everyone else did, that the solutions put in place through new laws had their desired effect.

“Good intentions were all that really mattered. There was a problem, you regulated it, and you just assumed that the problem would be taken care of,” says Chicago Booth’s Sam Peltzman. “Most of the world outside of economists still sees things that way, and we’ve gone through a bout of the folks in power seeing things that way.”

But in 1962, Stigler threw a wrench into this traditional way of thinking. In a groundbreaking paper on electricity prices, where the sellers were monopolies, he demonstrat-ed that government regulation hadn’t lowered electricity prices as much as expected. If regulation didn’t work to bring prices toward marginal costs in a monopoly, what kind of effect was it having in other situations? Were government regulations at all effective in correcting private-market failures?

Stigler went on to introduce regulatory capture in a subsequent paper. (See “How George Stigler changed the analysis of regulation,” Winter 2015.) The theory, which earned him a Nobel Prize in Economic Sciences, suggests that regulators are captured and dominated by large, moneyed interests that can formally sway regulators to their favor. It prompted economists to approach regulation as they do other economic questions, dissecting regulations with models and examining the actual effects and often not finding them to be as expected or promised.

That calls for deregulation, to allow the markets to sort out problems themselves. If regulation wasn’t having the intended effect, the argument went, it was not only unjustified, but it hurt other market players as well.

Police reform—or just the call for it—highlights how this theory, suggesting that regulators bowed not only to the profit interests of the groups that have an interest in a regulation, can have unintended consequences. The unintended consequences of regulation often emerge when people being regulated have to consider their own professional survival and change their habits accordingly, says Chicago Booth’s Canice Prendergast. And policy makers can overlook the effects of rule changes on people who have to live by those rules, she says.

Consider attempts to regulate the behavior of teachers, says Prendergast. In the United States, the 2001 No Child Left Behind Act required a certain percentage of students to reach particular reading standards. The result was that teachers, evaluated on the basis of test scores, tended to focus much of their energy on students who were close to meeting, but did not quite meet, the standards, leaving the highest- and lowest-achieving students to fend for themselves, according to Prendergast’s research. (No Child Left Behind was effectively repealed in 2015.)

“In some instances, teachers actually tried to persuade the academically poor children to drop out of school, not exactly the objectives you are looking for,” observes Prendergast. “That might get the teachers to the levels they need to keep their jobs, but certainly is not efficient. And for the poor children, they are doing a very bad service, especially those who need extra attention.”

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In 1976, Peltzman expanded on and formalized Stigler’s theory, suggesting that regulations bowed not only to the desires of industry. Peltzman argues that a regulator will lean toward a decision that optimizes political support from groups that have an interest in a regulation. However, when a crisis occurs, the public outcry is sometimes so large that those groups feel that they need to do something—anything—in response. The result is often a large, broad push toward stringent regulations, followed by an eventual swing back to moderation.

The accounting and auditing profession provides an example of this theory. For decades, auditing firms policed themselves through peer review, and there were concerns audit firms were failing to thoroughly review each other’s work. After the collapse of Enron and WorldCom, Congress, as part of Sarbanes-Oxley, created the Public Company Accounting Oversight Board (PCAOB) to address the scandal.

Almost immediately after its implementation, credibility in companies’ financial statements increased. To illustrate, Stanford’s Brandon Gipper, Leuz, and Maftel demonstrate that investors responded more strongly to earnings news after auditors became subject to public oversight. This seemed like an obvious improvement to a casual observer. But it isn’t clear that peer review is the best way of auditing oversight was the only or best way to solve the problem. “Could we have achieved improvements in peer review inspite of through a quasi-government bureaucracy?” asks Leuz, who is an advisor to the PCAOB’s Center for Economic Analysis. “Had we given the peer-review scheme more bite and access to more significant ‘sticks’ or penalties—as the new PCAOB has—would we have gotten improvements? Quite possibly. The academic evidence does not say that regulation or oversight is always better.”

The cycle is one that Peltzman predicted. He argued that regulators would create rules and enforce them more strictly when a particular industry was doing well, but could be convinced to ease up when times were tough. Regulation and deregulation are a natural part of the political process and a way to balance the needs of industry and society, he says. “There’s going to be an ebb and a flow, and it’s going to be of a type that I argued [in 1976] is intrinsic to politics,” Peltzman says. “Sometimes you’re pro-industry and sometimes anti-industry. Regulators tend to be pro-industry when things are rough for industry, and anti-industry when things are going too well. You try to balance across all of the organized interest groups. I think it became, over time, a broadly accepted view.”

Tightening regulation can have unintended consequences

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institutions of keeping the outsiders out and crafting the rules to benefit whoever makes the rules. And it has nothing to do with the basic problem of financial instability.”

Chicago Booth’s Luigi Zingales suggests looking at regulation through a different lens, however. The standard thinking espoused by capture theory is that regulation tends to hurt competition, as moneyed interests ensure that laws consolidate their hold on a market. But Zingales says that recent changes to banking and telecommunication laws could in some instances spur competition.

Mobile number portability has allowed customers to keep their mobile phone numbers when moving between carriers. Prior to MNP, changing mobile carriers meant reaching out to potentially hundreds of friends and associates, and changing business cards and websites, to reflect a new phone number. The hassle of changing numbers meant that mobile carriers could assume customers would stick around, even in the face of rising prices. MNP removed those roadblocks, allowing new players to enter the market.

Research by Daegon Cho of Korea Advanced Institute of Science and Technology and Carnegie Mellon’s Pedro Ferreira and Rahul Telang finds that MNP decreased market prices across 15 EU countries by 5 percent and increased consumer welfare by more than $1 billion per year between 1999 and 2006.

Banks have also long protected customer data, not only to keep accounts secure but to have an advantage when it comes to offering loans and other bank products and services. The EU’s PSD2 law in 2015 and open-banking rules that took effect in 2018 make such data largely available to third parties. This opens up competition and, in theory, will save those customers money.

“Procompetitive regulation seems like an oxymoron sometimes, but it’s not,” Zingales says. “We always think about regulation as a way to reduce competition in the market or as a way to address a failure in the marketplace.” Sometimes rules might be useful to actually facilitate competition in the marketplace.

Leuz suggests that transparency regulation could be an example of such procompetitive regulation. It is different from traditional regulation, which essentially uses a price mechanism. In an overview of regulation research, he recognizes that some findings suggest disclosure mandates don’t always work as intended, and yet the idea of using transparency rather than other types of mandates can produce positive results.

“Regulation needs to be smart,” Leuz says. “We need to be able to design it in a way that makes it work.”

How to build better rules

The idea that transparency regulation could be an example of such procompetitive regulation looks promising, but it can be tricky for researchers to study the effects of regulations, particularly when they have to disentangle them from those of a crisis that inspired new rules. But Leuz has some ideas for how to proceed. For starters, he argues that some questions about regulations can be addressed by emulating the model used in medicine: randomized clinical trials allow drugs or procedures to be separated, because the effects of the drug or procedure can be measured against a control group.

Implementing regulations more often in such or in similar ways would allow economists to see whether or not regulations work and decide how to modify them to achieve desired results.

While it might not have been Congress’s intention, the mine-safety findings illustrate how such a system could work. In the case of mining, the data were publicly available, but the new rule required only some mines to include them in SEC financial-disclosure reports. That essentially produced the equivalent of a clinical trial, where some mines were subject to a new treatment and others were not. The mines required to report the data had fewer accidents and citations, likely because their investors, when safety issues were made salient, didn’t want to be on the hook for fines and payouts.

“Information is also crucial. Companies have more data than ever about their customers and business. At the moment, economists don’t have access to much of these data. But Leuz argues that opening up those troves, even in limited or confidential ways, could significantly improve evidence-based regulation research.”

“The biggest challenge for causal evidence and better policy-relevant estimates, however, is lack of relevant data that are sufficiently granular to identify and measure regulatory effects,” Leuz argues. “If we are serious about evidence-based policy making for financial regulation or accounting, regulators and standard setters need to actively help with generating relevant data and fostering research, essentially building economic analysis into the process of rulemaking.”

He adds that meta-analyses, which pool studies to make statistical conclusions, and a clearinghouse that summarizes the best research on topics related to regulation can help inform the decisions that have to be made by policy makers who need unbiased information.

For Leuz, evidence-based policy making holds the promise of transcending the old ideologies surrounding regulation.

“We’ve recognized that these things are a lot more complicated and that it isn’t as simple as ‘markets are good’ or ‘regulation is bad,’ or the other way around,” Leuz says. “These views still exist, but we should move beyond them and make room for theoretical and empirical research that helps us improve regulations, so that the new rules are based on or at least guided by evidence.”

— CHRISTIAN LEUZ
**THE COMIC**

**YOUR POLITICS ARE SHOWING!**

By Boggy

Thanks for coming in, Chicago Booth's Elisabeth Kempf and Cornell's Margarita Tsoutsoura.

So what's the problem?

But I wonder, could his politics be affecting his job? Hi!

Well, Steve's a great bond rater, and I love talking current events with him at cocktail parties.

I'm in charge of a company that assesses the risk of bonds for investment banks. My anti-Trump merch collection has nothing to do with my job!

We wanted to see if political preference affected bond ratings, so we looked at 450 credit raters who cover 1,700 companies.

Their party affiliations are available through voter records. We sorted them as Democrats, Republicans, or Independents from 2000 to 2015: the Clinton years through the Obama years.
**Our data included analysts that were aligned with the president’s party...**

**I DON’T BELIEVE IN WMDS OR OBAMA**

So how did analysts change their ratings when the president changed?

**When credit raters were not part of the presidents’ party, they rated bonds as riskier. On average, they lowered bond ratings by an extra 0.015 notches compared with those made by raters who were part of the presidents’ party every quarter. As the average rating change over the study period was 0.16 percent, that suggested 10 percent of the average rating change was influenced largely by political party.**

**Well, what’s the problem? I’ll rate bonds lower as long as Trump is around, and Republican raters will rate them lower when Lin-Manuel Miranda is president.**

**But we also looked at the data alongside the Philadelphia Fed’s Partisan Conflict Index, which uses newspaper headlines to gauge division. In times of intense political divide, the partisan effect was 75 percent larger!**

**It was also more visible during elections and among more politically outspoken analysts.**

**I wonder if this is one of those moments of intense political divide.**

**Oh, hey, the prez just tweeted that he has “the power to fire congressmen.” HE SHOULD BE IN JAIL RIGHT NOW!!**

**Make our fiction again.**
An alien who visited Earth in the mid-1980s and came back today would see one clear difference: far more people in public spaces ignoring the world around them and staring at a small rectangular device, what she would come to learn is called a “smartphone.” Soon, the smartphone may be replaced by a device implanted in our body that connects with our mind and provides instant access to both computing power and enormous databases. Computer-enhanced humans are no longer the realm of science fiction. The information and communications technology (ICT) revolution has fundamentally changed what we spend time on, how we interact with one another, what work we do and where we do it, and even how people commit crime. Most importantly, it has upset the balance between the three pillars—the state, markets, and the community.

The ICT revolution has not just followed the course of previous revolutions by displacing jobs through automation; it has also made it possible to produce anywhere and sell anywhere to a greater degree than ever before. By unifying markets further, it has increased the degree of cross-border competition, first in manufacturing and now in services. Successful producers have been able to grow much larger by making where it is.

Some people are prospering, while others are left behind.

John C. Heaton
Faculty codirector of Private Wealth Management, Joseph L. Gidwitz Professor of Finance

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Technology is splitting the job market

Successful producers have been able to grow much larger by making where it is.
The effects on jobs
The ICT revolution has eliminated certain categories of jobs, while enhancing the importance and reach of others. It also has had an important indirect impact, by teaching employers certain tasks to be outsourced while increasing the insourcing of others. As a number of studies have pointed out, in recent years new technologies have eliminated jobs that involved well-specified routines or simple tasks. For example, the Amazon Go store (opened first in Seattle) tries to create a shopping experience where you can “just walk out”. Counters. As you walk in, you use the app on your phone to register your presence, pick up what you need, and walk out. Later, your Amazon account is billed. Computer vision and machine-learning algorithms, similar to the ones used in driverless cars, help identify what you pick up, and tote up your bill. Not only does this way do with checkout clerks, it has also reduced the need for someone to monitor stock levels, order new inventory, or reconcile the store’s books at the end of the day. The automated system does it all.

Of course, it has not done away entirely with the need for more unequal, economic diversity within communities has fallen while diversity between them has increased. This sorting of human capital across communities has increased the inequality in access to the capabilities necessary to compete in the market. Inequality, not just in economic outcomes but in opportunities, has therefore become an enormous problem. In the US, it shows up between residents of big cities or rich suburbs and small, economically depressed rural towns; between workers in big, young, successful service companies and small, older, struggling manufacturing jobs, and between the top earners and the rest. The roots of this inequality lie not only in technological change, but also in the failure of the community and the state to balance and modulate markets.

These inequalities are also present, if to a lesser degree, across international lines. Furthermore, the path of integration of continental Europe has chosen to highlight new inequalities, between the protected jobs of the older generation and the poor-paying jobs available to the youth or immigrants, between the political power of the large European countries and the weakness of the smaller ones, and between agriculture and industry. Yet Northern Europe and the relative backwardness of the unformed southern periphery. The period of integration, all the inequalities have come into the European fold.

The rich, skilled tax lawyer earns significantly more, and has more work than she can handle; the middle-class tax accountant is typically worse off.

Communities are changing
Visit our website for other essays about technology and society
Recently, I was reminded of the commonly used slogan “evidence-based policy.” Except for pure marketing purposes, I find this terminology to be a misnomer, a misleading portrayal of academic discourse and the advancement of understanding. While we want to embrace evidence, the evidence seldom speaks for itself; typically, it requires a modeling or conceptual framework for interpretation. Put another way, economists—and everyone else—need two things to draw a conclusion: data, and some way of making sense of the data. That’s where modeling comes in. Modeling is used not only to aid our basic understanding of phenomena, but also to capture how we view any implied trade-offs for social well-being. The latter plays a pivotal role when our aim is to use evidence in policy design. This concern has not been erased by our current data-rich environment. Others have weighed in on how to give policy-relevant interpretations to evidence. Back in 1947, Tjalling Koopmans, a prominent member of the Cowles Commission (an economic-research organization then headquartered at the University of Chicago, and now housed at Yale), wrote an essay called “Measurement without Theory,” exposing the limitations of well-known evidence on business cycles. This same theme was revisited later by other scholars affiliated with the Cowles Commission, namely Jacob Marschak and Leo Hurwicz, and then again in an acclaimed paper by my current and longtime colleague Bob Lucas written in 1976. Of course, the generation and construction of new data adds much richness to economic analyses. For many important economic questions, however, empiricism by itself is of limited value. For a recent exchange illustrating divergence in opinions given evidence, consider the disparate viewpoints of two excellent economic historians, both working at the same institution: Northwestern’s Joel...
There are a myriad of reasons why the future should bring more technological progress than ever before—perhaps the most important being that technological innovation itself creates questions and problems that need to be faced through further technological progress. And here’s Gordon, with a markedly less rosy analysis. . . the rise and full of growth are inevitable. When we recognize that progress occurs more rapidly in some time periods than others. . . the 1870-1970 century was unique. Many of these inventions could only happen once, and others reached natural limits.

Gordon warns us that we can’t expect technological progress to keep up with the pace it set in the previous century, whereas Mokyr says, to paraphrase, “That century was special, but other special things happen in the future in ways we can’t fully articulate right now. There’s no reason to be pessimistic about technological progress going forward.” These are two astute scholars relying upon the same historical evidence, yet their conclusions are different. Why? The evidence alone does not answer the question they are addressing, and different subjective inputs to help in extrapolating from the evidence. (For more from Mokyr and Robert Gordon. Here’s Mokyr was unique: Many of these inventions and aggregate it in a way that’s useful for social outcomes in the future, so we’re disappointed that the evidence itself does not contain all the answers is crucial to an informed society. We’re living in a world that along some dimensions feels very data rich. We’re able to collect a lot of data, we have powerful hardware to process them, and we have machine-learning techniques to find patterns in them. But many of the important questions are about fundamental dynamics. They’re in areas in which, along some dimensions, our knowledge is sparse. How do we best handle financial-market oversight in order to limit the possibilities of a big financial crisis? What economic policies should be in place to confront climate change? For such problems, we need more than a call for action; we need the implementation of precise policies while speculating on their impact. Many of the people who influence, or want to influence, public policy are reluctant to acknowledge that we’re often working with incomplete information. Ambiguity, they believe, is hard to sell to the public or to politicians claiming to represent the people. Policy makers often seek confidence in policy outcomes, even when this confidence is not justified. As a result, there will always be people willing to step to the forefront to give confident answers. Friedrich Hayek warned of this in his Nobel lecture. The conflict between what, in its present mood, the public expects science to achieve in satisfaction of popular hopes and what is really in its power is a serious matter because, even if the true scientists should all recognize the limitations of what they can do in the field of human affairs, so long as the public expects more, there will always be some who will pretend, and perhaps honestly believe, that they can do more to meet popular demands than is really in their power.

There are aspects to climate change and its economic ramifications that we don’t fully understand. We have some evidence from economics. We have some evidence from climate science. In neither case does the evidence speak for itself in terms of the precise impacts human actions today will have on the climate and social outcomes in the future, so we’re attempting to use models to help fill in the gaps of our understanding. Of course, we don’t need to know exactly what the magnitude of the damage to the climate is in order to know we need to try to mitigate it. Waiting to address it could be incredibly socially costly. It’s enough to know there’s a possibility of bad outcomes to make you want to act now. But there are those who suggest we shouldn’t dilute the public’s attention by saying, “We don’t fully understand the climate system and the economics of climate change.” They feel that if we advertise this to the public, it will lead to nothing being done to address climate change.

I find that discussion depressing. Prudent and smart decisions don’t require full knowledge. They require that you assess the uncertainty and figure out its potential consequences. The uncertainty doesn’t mean there will be no action. There will be action, close your eyes, and do nothing while you wait for complete certainty. In economics, we will be “learning by doing.”

More agreement between models might make less arguing among politicians and the people who advise them, but it wouldn’t necessarily make economics more useful as a science. No one has yet built, or will ever build, a perfect model. A model is a simplification, an abstraction; it’s not meant to be a full descriptor of reality.

From theory to policy
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CEOs, you are free to be socially responsible

Revisiting Milton Friedman’s famous doctrine on profits

A few years back I heard a mischievous remark about the comparative achievements of Friedrich Hayek and Milton Friedman, the Nobel Prize-winning economists who had an enduring passion for free markets, free people, and the free thinking that goes on at the University of Chicago, where the two men were colleagues.

Hayek was a good economist and a great philosopher, while Friedman was a great economist and a good philosopher.

The verdict still makes me grin, and if it emphasizes Friedman’s shortcomings as a philosopher, a vocation that vacillates between subtlety and hatsplitting, it inadvertently points to another achievement: his legacy as a preeminent public intellectual. Hayek was courtly, soft-spoken, and reserved to the point of reticence, but his younger colleague had a taste for intellectual combat and welcomed any opportunity to grind the ax of his ideas. For nearly 50 years, he posted lengthy op-eds to preeminent newspapers, butted heads with better-known adversaries, and even hosted a popular television series whose pithy title captured the libertarian bent of his contentions: Free to Choose.

Today, nearly a dozen years after Friedman’s death, the most enduring of his arguments remains one of the least considered, a claim that long ago slipped the bonds of debatable assertion and ascended to the oxygen-deprived heights of truism: “The Social Responsibility of Business is to Increase Its Profits.”

This is the title of Friedman’s essay as it appeared in the New York Times Magazine in fall 1970. At the time, an editor helpfully appended “A Friedman doctrine,” an addition warning readers that what followed was nothing less than a radical pronouncement.

Today, the idea that a company has no social responsibility other than maximizing shareholder returns is unremarkable, even commonplace, but when Friedman first made it, it would have seemed as provocative to his readers as if I made the suggestion to you that Microsoft be nationalized. In fact, the latter contention was much closer to mainstream thought than Friedman’s was when he penned his essay, which is one reason he presented his views so pugnaciously. “Businessmen believe that they are defending free enterprise when they declare that business is not concerned ‘merely’ with profit but also with promoting desirable ‘social’ ends,” he wrote at the beginning of his essay. “In fact they are—or would be if they or anyone else took them seriously—preaching pure and unadulterated socialism.”

The “social end” Friedman cites—“providing employment, eliminating discrimination, [and] avoiding pollution”—are hardly exceptional concerns, even today, and such bluster underscores two important points about the essay, one a misconception it made common, the other a historic development it largely ignored.

A legal opinion

The misconception Friedman made common is that his thesis is actually a legal mandate. Contrary to what many people think, the law doesn’t require corporate directors to run a company consistent with maximizing the wealth of shareholders. Yes, they have a fiduciary duty not to recklessly mismanage a company, but nearly apart from instances of pilfering and outright fraud, judges are loath to play chairman of the board and dictate to companies the terms of prudent management.

Consider Dodge v. Ford Motor Co., 170 N.W. 668 (Mich. 1919), a dispute that ostensibly illustrates a company unlawfully frustrating its own interests over the interests of shareholders. Near the end of World War I, Henry Ford concluded that, rather than pay a $60 million dividend to shareholders, he would reinvest these profits in order to expand production and further cut the cost of the Model T for consumers. Explaining his decision, Ford maintained: “My ambition is to employ still more men, to spread the benefits of this industrial system to the greatest possible number, to help them build up their lives and their homes.”

Contrary to what many people think, the law doesn’t require corporate directors to run a company consistent with maximizing the wealth of shareholders.

The automotive magnate had already become a poster boy for industrial paternalism with his “Five-Dollar Day,” an initiative that rewarded workers the said amount if their home life (on review of the company’s “Sociological Department”) lived up to Mr. Ford’s vision of happy, healthy living. Still, an abject pronouncement that the company would pursue policies that held profits in lower regard than the philanthropic ambitions of its founder appeared something apart from previous efforts, and the court seemed to signal that Ford had flouted his responsibilities as a fiduciary for the company.

“There should be no confusion,” the justices of the Michigan Supreme Court wrote in the section of their decision that has been a touchstone for corporate law classes for nearly a century. “A business corporation is organized and carried on primarily for the profit of the stockholders. The powers of the directors are to be employed for that end. The discretion of the directors is to be exercised in the choice of means to attain that end, and does not extend to . . . other purposes.”

This passage appears to provide a legal underpinning for Friedman’s thesis. Then again, if it did so effectively, coming nearly 50 years before his essay was published, there would have been no reason for him to issue his broadside. As the late legal scholar Lynn A. Stout observed, Dodge v. Ford is “a doctrinal oddity largely irrelevant to corporate law and corporate practice.” More importantly, she continued, “courts and legislatures alike treat it as irrelevant.”

As Stout noted, the most famous passage in the court’s ruling is actually dicta, lawspeak for parts of a decision that are incidental to the holding. Ford’s failure was not that he refrained from maximizing his own company’s profit, but that he clearly chose to do so to the detriment of John Francis Dodge and Horace Elgin Dodge, minority shareholders who together controlled 50 percent of Ford’s stock.

The second-largest shareholders of the company, the Dodge brothers were correctly suspected by Henry Ford of wanting to use their dividends to establish a rival motor company. Ford hoped to thwart those ambitions by withholding the dividends that would underwrite their efforts, a motivation, the court held, that was in conflict with the duty of good faith he owed minority investors.

Legally speaking, therefore, the problem with Ford’s decision was not profit maximization per se. Indeed, the court went out of its way in the ruling to acknowledge the lawfulness of “incidental...
humanitarian expenditure of corporate funds for the benefit of those less fortunate, like the building of a hospital for their use and the employment of agencies for the benefit of the homeless. While Henry Ford made a sort of such “incidental” activity, his own company was only engaged in undertakings that appeared to enrich the broader community at the expense of its own employees. Friedman was aware of such behavior— if anything, the philanthropic propensities of publicly held companies had grown stronger in the subsequent half-century—and in his essay, he wavers in respect to them. “It may well be in the long-run interest of a corporation that it is a major employer in a small community to devote resources to providing amenities to that community or to improving its government,” he writes. “That may make it easier to attract desirable employees, may reduce the wage bill or lessen losses from pilferage or sabotage or have other worthwhile effects.” And yet, Friedman resisted a full-throated endorsement of such behavior, should an entrepreneur person committed to plugging his ears against the appeals of history would suggest that the threats to capitalism of Friedman’s day remain our own.

Why executives might embrace a broader notion of a corporation’s “social responsibility” is a matter that Friedman barely addresses. It wasn’t until the second half of the 19th century, with the arrival of business people that required the kind of investment risk that required the kind of investment risk that individual or corporation that preferred, indeed, might be called upon to handle.” Yet, even with the rise of the railroads, the first multinational industry that Friedman himself mentioned in this essay. “A businessman of today would find himself at home in the business world of 1890,” he wrote, “but the business world of 1840 would be a strange, archaic, and arcane place. So, too, the American business of 1840 would find the environment of commerce fairly more familiar than that of his own nation seventy years later.”

These changes, and their implications for the corporation, were not lost on the men and women who came of age between World Wars 1 and 2. In Concept and Substanc e, a landmark study of General Motors first published in 1946, the sociologist and management guru Peter Drucker called the modern company the defining institution of American life. “[T]he large corporation,” he wrote, “has evolved as the representative and determining socio-economic institution which sets the pattern and determines the rules of the game for all persons in the business world.”

And the degree to which our social liberties and responsibilities are realized in and by the large corporation.”

How well do major corporations reflect the highest aspirations of America? Economists, politicians, public intellectuals, labor leaders, and business executives alike wrestled with that question for decades before Friedman effectively told them they needed better. “You don’t do better than Friedman has responsibilities” he sniffed. “Only have responsibilities.”

“Let us consider what this means,” Friedman at his most philosophically ironclad, to shareholders and stakeholders.”

Brush up on business ethics More articles and videos by John Paul Rollert are available online.

John Paul Rollert is adjunct assistant professor of behavioral science at Chicago Booth.
How to sell a carbon tax

Remember that some taxes aren’t about generating revenue

When voters in Washington state roundly rejected a proposed carbon tax in November 2018, it was a grim moment for those who support carbon taxation not only in the Evergreen State, but anywhere else in the United States. Politics in Washington tend to lean strongly to the left—Hillary Clinton beat Donald Trump there by nearly 16 percentage points in 2016, and both senators and seven of 10 congresspeople are Democrats—and yet the carbon tax lost by a 12-point margin. Is carbon taxation the rare idea that liberals and conservatives can agree to? How about a carbon tax? Is the idea a good one? What do you get in return? More specifically, what does the government do with the money it collects? According to the Wall Street Journal, “The point is not to fund big government projects. If you want to fund big government projects, you do it out of the broadest-based and fairest tax you can find.”

As Tyler Cowen suggested in a Bloomberg article after the vote in Washington state, for proponents of a carbon tax—including many economists—“it’s time for a change in tactics. These new approaches might start with the notion that we can address climate change without transferring more money from voters to politicians.”

Here are three ideas for doing so:

Institute a revenue-neutral carbon tax. Use the carbon tax to offset other taxes. If carbon taxes were coupled with an explicit reduction in other taxes, it might help to convince people. If the carbon tax were coupled with the elimination of other taxes, it would help more. Taxes are like zombies: if you just lower the rates, they tend to come back. If you eliminate them entirely, perhaps requiring a referendum for their reinstatement, there can be more faith that they won’t come back. Couple the carbon tax with elimination of, say, state property taxes, income taxes, or sales taxes.

And in the end, we all know taxes must equal spending. If you resolve not to spend more, you might convince voters there won’t be more taxes. Advertising the carbon tax as a substitute for carbon spending, thereby eliminating green boondoggles, would help to seal the deal.

Perhaps the voters of Washington had less than full faith that a large increase in green boondoggle spending by the state government was a good idea.

Perhaps the voters of Washington were not so much against a carbon tax per se, but rather had less than full faith that a large increase in green boondoggle spending by the state government was a good idea. They need only to look south at California’s high-speed train to see cost-benefit analysis at work in dollars per ton of carbon saved. Or perhaps thousands of dollars per ounce. Such spending violates the whole idea of a carbon tax, which is to give people and businesses an incentive to figure out their own ways to cut carbon emissions. The point is not to fund big government projects. If you want to fund big government projects, you do it out of the broadest-based and fairest tax you can find.

The key question about a carbon tax is: What do you get in return? More specifically, what does the government do with the money it collects? According to the Seattle Times, Washington’s carbon tax would have taken effect in 2020, rising year after year to finance a multibillion-dollar spending surge intended to cut Washington greenhouse-gas emissions. The initiative reflected proponents’ faith that an activist government can play a key role in speeding up a transition to cleaner fuels. The fee would have raised more than $1 billion annually by 2023, with spending decisions to be made by a governor-appointed board as well as the state’s utilities.

Send the proceeds back to the voters. Former Chicago Booth dean George Shultz, who co-founded the Heritage Foundation and served both former US secretaries of state and the Treasury, advocated this solution in a 2017 Wall Street Journal op-ed. Write everyone a nice check. This ensures that the money doesn’t go to boondoggles, and it gives every voter a stake in keeping the scheme going. It is highly progressive, which Democrats should like. A large and bipartisan group of economists reiterat ed support for this proposal in a January 2019 Wall Street Journal op-ed.

A variation of this idea is one I suggested several years ago: rather than a tax, give each American a right to X tons of carbon emissions that they can sell on a carbon market. That also gives everyone an incentive to vote for the system. And it states the issue squarely: you, a voter, are having your air polluted. You have a right to collect on that damage. It makes it clear that carbon use results in a fee, a penalty—not a “tax.” The point is to disincentivize the use of carbon, not to raise revenue for the government to spend. “Tax” is a loaded word in American culture and politics; carbon rights takes the whole discussion away from a “tax.”

Trade the carbon tax for regula tions. Institute a fee for all of the other carbon subsidies and regulations. To those who don’t believe in climate change: OK, but our government is going to do all sorts of crazy stuff. Let’s cut out the fee and just give a refund for their fee instead. No more electric car subsidies—$15,000 from taxpayers to each Tesla owner in Palo Alto, California—or high-occupancy-vehicle lanes, windmill subsidies, rooftop solar mandates, washing machines that don’t wash clothes anymore (tip to US consumers: don’t buy any washing machine built since January 1, 2000), and so on and so forth.

I think on the left, the strategy has been to ramp up climate hysteria: if we just yell louder and demonize opponents more, the voters will buy it. No matter how much of a problem you think climate change is, let’s admit that’s not working. In part, the claims are now so over the top that everyone can tell it’s gone too far. No, the way to do it is to do efficiently via a carbon fee rather than at massive cost, as we are doing now.

Politicians and environmental advocates who really want to reduce carbon emissions should start looking for solutions that might appeal to this centrist element. Perhaps the voters of Washington had less than full faith that a large increase in green boondoggle spending by the state government was a good idea.

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What to tell a subordinate who’s failing

Your newest hire loves the job—but is underperforming

T he third installment of our quarterly Business Practice feature asked readers to imagine having to deliver negative feedback to a subordinate:

You manage a team of analysts at Trend Line, a market-research firm. Their role is to collect data on the restaurant industry and compile it in written reports. The reports are recognized as among the best in the business, in part because they are easy to read. Because of this, you value your analysts as writers as much as researchers.

You hired Stephanie as an analyst about six months ago, and several of her assignments have come due. She has mentioned that it was a joy to write the reports and that she is excited to get feedback from you. But there’s a problem: her prose is awful, almost unreadable. It has problems that go way beyond the stylistic type.

This morning, she came by your office and asked how you liked the reports. You hardly knew what to say, so you asked her to come back in the afternoon to talk. She smiled, said yes, and bounced out the door.

What do you say to her when you meet?

Depending on when readers visited the Chicago Booth Review website, they saw either this scenario or an identical one involving Stephanie’s male counterpart, Stephen. Any responses that they subsequently rated were written for the same version of the scenario they read and responded to. Sneaky of us.

Why is this question difficult? This scenario is a twist on our last Business Practice conundrum, in which participants had to navigate a tricky peer confrontation. Now you are a manager who needs to give feedback to an underperforming subordinate. Being the boss, for sure, makes this conversation a little easier. But there are other things that make this situation unpleasant, most notably that Stephanie/Stephen is clueless: she/he is expecting accolades. More generally, managers, like all people, may anticipate interpersonal conflict and tend to shy away from such encounters or deliver less harsh feedback than is appropriate. Consequently, many of us are relatively inexperienced at delivering negative feedback. And because we avoid these kinds of situations, there is little opportunity to disconfirm a possibly exaggerated fear of a negative interaction.

Top-rated responses

Now for the top three responses I’ve listed names and backgrounds when I’ve gotten permission to do so.

1. Response: “Give her the sandwich.”
   Good-bad-good feedback.
   “Start with good: love the enthusiasm, and it shows you love her job.
   “Then the bad: what makes Trend Line an industry leader is readability. Your recent assignments have fallen short of this. Ask her to critique and walk through.
   “Close with good: offer coaching and help to get to expectations.”
   Average rating: 5.2
   Participant: Kevin
   Background: Management consultant

2. Response: “I love your energy and passion to help resolve this on priority.
   “It is great that you are proactively seeking feedback, and I did want to confess that the quality of prose in those reports does not do any justice to the valuable insights you have come up with.
   “Engaging and lucid prose is one of the major reasons our reports are considered valuable, apart from the industry insights. I believe we can easily magnify your impact by reworking the language a little, as the underlying analysis is great.
   “I have found a few online learning modules that may be helpful as refreshers as you begin editing. You could also reach out to our editing team directly for advice. Please let me know if you can think of anything else we can initiate to help resolve this on priority.”
   Average rating: 5.44
   Participant: Jas
   Background: Unknown

3. Response: “This situation requires appreciation, but also honesty and reinforced accountability. Assuming Stephanie’s content is good, but his delivery needs work, I would sit down with Stephen and tell him exactly that.
   “If our team’s research is known to be the best in the business and easy to read, I would ask Stephen to reread his own work and think about how his reports would sound to a reader/consumer and not just an analyst. From here, I would reinforce the soundness of his content, but we would work together to rephrase and develop a plan that spells out what is acceptable and how we are going to work together to achieve it. This may include working with Stephen to set up a template, or holding weekly or biweekly one-on-one meetings to really delve into Stephen’s thought process as he is writing his report, so I can reinforce the need to approach the reports in the mind-set of a reader. It’s important to affirm Stephen’s ideas/content as an analyst, but be specific in how he can improve his writing.”
   Average rating: 5-2
   Participant: Jas
   Background: Unknown

I nterestingly, the mean rating of 4.01 pinged in. I have been going through some of your reports and am so glad to have you on the team. You have generated quite some valuable insights from the restaurant industry data and I am sure it will be useful for anticipating future trends.

“Thank you for your prompt and detailed feedback. We will definitely put your comments into consideration for future reports.”

Mentorship, especially for a new employee, can be a helpful strategy for improving performance.

The Basics of Business Practice

Business Practice is a quarterly tool created in cooperation between Chicago Booth Review and the Harry L. Davis Center for Leadership at Chicago Booth. Its purpose is to allow readers to rehearse their responses to challenging professional situations, and to get crowdsourced feedback on those responses from other readers. For each installment of Business Practice, we:

- Describe a workplace scenario that includes a strategic or interpersonal conundrum
- Invite readers to script a response to the scenario
- Allow respondents to rate each other’s answers on a scale of 1 (“Strongly disapprove”) to 7 (“Strongly approve”)
- Send every respondent (who provides an email address) personalized results showing how others reacted to his or her approach to the situation

A histogram of all ratings is shown on the following page. The mean rating of 4.01 sits almost exactly in the middle of the scale. This scenario, like the previous...
two installments of Business Practice, is a difficult situation in which it is nearly impossible to produce a response that everyone will find outstanding. We next turn to the average ratings of each response submitted. The following analysis is restricted to the 81 responses with five or more ratings, with the average rating for each of those responses plotted on the histogram on this page. The overall average rating is 3.89, with responses ranging from the worst rated response (0) to the best-rated response (5.44). As has been the case in the past, many responses were viewed as “reasonable,” but there were no responses that were universally seen as outstanding.

Sample responses

To give you a sense of the range of ratings, I’ve listed a few responses spanning from unfavorably rated (5 percent in the distribution), to favorably rated (90 percent in the distribution). All responses in the distribution, to favorably rated (90 percent in the distribution), were viewed as “reasonable,” but there were no responses that were universally seen as outstanding.

5 percent response

Answer: “Appear to be in a tough spot, and ask: ‘How can I help you get the prose writing to the level typically expected?’”

Average rating: 2.11

50 percent response

Answer: “Thanks for getting this done, Stephanie. How was your experience writing these reports? What did you enjoy most? Did you find anything challenging?”

“I’d start by asking these questions to encourage self-reflection and so I could understand any challenges that arose. Then I would provide feedback: The research in the analysis is excellent. Particularly specific [example because [specific reason]. Great work.”

“One area I found that does need improvement is the prose. I found it hard to follow, but once I got through it, the insights were compelling. [If she found prose challenging] I would rework the draft, and ask: ‘How can I help you get the prose writing to the level typically expected?’”

Average rating: 4.3

How people rated the responses

After submitting their response, participants could then rate the responses of others on a scale of 1 to 7. The average rating landed almost exactly in the middle of the scale.

Ratings for all responses

Distribution of 982 ratings for 102 responses

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Participants’ rating choices

Responses with at least five ratings

Distribution of average ratings for 93 responses

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Common elements in people’s responses

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How much the element affected a response’s average rating on the 1–7 scale

Overall average: 4.01

50 percent response

Answer: “I think it’s nice that you’re considering working with [colleague] on [prose]. As a side benefit, the high performer you tap as a mentor may find the role motivating. • Mentorship, especially for a new employee, can be a helpful strategy for improving performance. As a side benefit, the high performer you tap as a mentor may find the role motivating.

• Using the caged threat of threatening job security is unlikely to be successful. Although, at some point, managers do need to make underperformers aware of what their job. In some situations, premature discussion of the prospect of unemployment is bound to be unproductive.

• Needless to say, treating employees differently based on gender is a bad practice. But it can happen unconsciously. To be aware of the implicit associations that may affect your leadership.”

George Wu is John P. and Lillian A. Gould Professor of Behavioral Science at Chicago Booth.

Go to More Business Practice

Notes and data are published quarterly, and anyone is free to submit responses. Look for them online at: Review.ChicagoBooth.edu.

ILLUSTRATION BY JOEY GUIDONE

DISAPPROVE

STRONGLY DISAPPROVE

APPROVE

STRONGLY APPROVE

Average response: 3.89

Participants’ rating choices

Responses with at least five ratings

Distribution of average ratings for 93 responses

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Answer: “I think it’s nice that you’re considering working with [colleague] on [prose]. As a side benefit, the high performer you tap as a mentor may find the role motivating.

• Mentorship, especially for a new employee, can be a helpful strategy for improving performance. As a side benefit, the high performer you tap as a mentor may find the role motivating.

• Using the caged threat of threatening job security is unlikely to be successful. Although, at some point, managers do need to make underperformers aware of what their job. In some situations, premature discussion of the prospect of unemployment is bound to be unproductive.

• Needless to say, treating employees differently based on gender is a bad practice. But it can happen unconsciously. To be aware of the implicit associations that may affect your leadership.”

George Wu is John P. and Lillian A. Gould Professor of Behavioral Science at Chicago Booth.

Go to More Business Practice

Notes and data are published quarterly, and anyone is free to submit responses. Look for them online at: Review.ChicagoBooth.edu.
Don’t write off a ‘failed’ entrepreneur

“Failure” is critical to innovation entrepreneurship.

I recently received an email from a former student of mine, Mrin. It was a thoughtful debrief on why she had decided to shut down the company she had been coaching her on last year for the Edward L. Kaplan, ’71, New Venture Challenge, an annual start-up competition and accelerator program sponsored by Chicago Booth. The experience was a difficult one for her, and she told me she had trouble disentangling the failure from her personal identity. In her own words, which she has given me permission to share, “I’ve never been more aware of how much I don’t know. And, at the same time, I’ve never learned so much so quickly. Shutting down the company has had me grappling with feelings of failure while questioning my self-worth and abilities.”

What Mrin finally realized is that she had not, in fact, failed. The Merriam-Webster.com Dictionary offers several definitions of the word “fail,” including, and I’m paraphrasing: to lose strength, fade away, stop functioning normally, fall short, be inadequate, be unsuccessful, become bankrupt, disappoint expectations, be deficient in, leave undone, or not pass some test. None of these applies to Mrin’s or any other entrepreneur’s experience in trying to bring an innovation to market and learning that it does not work as a business. To fall short or be unsuccessful requires some agreed upon definition of success. To disappoint expectations means that there are some expectations to disappoint. Mrin did not stop functioning, fade away, or leave something undone. No, in fact, Mrin accomplished a lot.
As Thomas Edison said when an associate suggested that it was a shame myriads of experiments to produce a nickel-iron battery had not produced any results, “Result? Why, man, I have gotten a lot of results! I now know several thousand things that won’t work.”

Entrepreneurship, especially innovation-focused entrepreneurship, is very much like science—invoking a series of experiments that can bring something new and valuable into the world. You cannot learn what product or idea will work without being willing to discover what won’t work. This is known by every successful entrepreneur, most of whom have business “failures” in their portfolios. Before Evan Williams started Twitter, he founded Odeo, the podcasting platform you’ve never heard of. Before Reid Hoffman created LinkedIn, he launched SocialNet, a dating site that didn’t connect. Nick Woodman shuttered EmpowerAll.com and Funbug before clicking with GoPro. “Failure” is critical to innovation entrepreneurship. I invested $40,000 in an e-book company that created the largest database of off-copyright texts that existed in the commercial market at the time. I lost every dime. Why? It was 1994. There were no e-readers. Laptops weighed 12 pounds and weren’t fun to carry around. You got on the internet via slow, dial-up connections, and Amazon didn’t exist as a distribution channel. Countless companies launched tablet computers that went nowhere—think Apple’s Newton experiment, which was released in 1993, before a market coalesced around the beautiful iPad and its App Store. Many factors including timing, markets, technology, and the right team need to come together in order for a new product or business model to be successful, and if one of these cracks the code, value is created.

Small-business and innovation entrepreneurship differ

Not all entrepreneurs start out with the intent of bringing innovation to market, of course. Many small-business entrepreneurs are trying to provide for their families, be their own bosses, and have flexibility in their schedules—in fact, the vast majority of people starting companies are trying to build small businesses. In 2017, only about 40 percent of founders in the US and Canada said their product was new or innovative, according to data from the Global Entrepreneurship Monitor (GEM), a research organization focused on entrepreneurial activity. In China, the number was 25 percent, in Indonesia, was less than 12 percent. At the same time, while 60 percent of North American founders expected to create some jobs and hire employees, fewer than 15 percent foresaw needing 20 or more employees in the next five years, and worldwide, those expectations fell to less than 8 percent. These founders clearly aren’t aiming for unicorns, which create thousands of jobs.

What causes “failure” is different for these two kinds of entrepreneurs, growth entrepreneurs and small-business founders. When US Bank conducted a survey of small-business owners whose companies had failed, the two top reasons cited involved capital: 82 percent said they’d failed due to poor cash-flow management, and 79 percent blamed starting out with too little money. But compare that to a survey by CB Insights, a data company looking at VC-backed companies, which, by definition, are trying to innovate and scale in order to get venture funding. In this survey of founders who shut their companies, the No. 1 reason listed, by 42 percent of respondents, was an inability to find product market fit—“no market need,” as CB Insights puts it. Only 29 percent of founders said they ran out of money.

Nevertheless, for both growth entrepeneurs and small-business founders, research suggests that the learning process of opening and closing a business increases the chances of success the second time around. University of Michigan’s Francine Lafontaine and Stanford’s Kathryn Shaw looked at retail business founders’ typical small-business entrepreneurs—in Texas, from 1990 to 2012. Only about 25 percent of these retailers opened more than one establishment over those years, but these serial entrepreneurs were, in Lafontaine and Shaw’s words, “considerably more successful,” with 7 percent lower likelihood of shutting down overall than for inexperienced founders. And the effects were cumulative. Each previous business lowered the hazard risk by nearly 4 percent.

Lafontaine and Shaw were not able to determine with the data set they used whether the businesses shut for positive and neutral reasons such as a sale, a better opportunity for the owner, or retirement, or for negative reasons such as bankruptcy, lack of profitability, or legal problems. As a result, it is impossible to determine how much of a future boost toward success came from a small-business failure versus a positive exit. But in research on innovation entrepreneurs, Harvard’s Paul Gompers, Josh Lerner, and David S. Scharfstein and the Federal Reserve Bank of New York’s Anna Kovner were able to isolate the impact of a failure versus a success on a serial entrepreneur’s next venture. They used data, captured by Dow Jones’s VentureSource database, on nearly 10,000 VC-backed companies founded between 1986 and 2000. Over 1,000 of the companies were founded by serial entrepreneurs. What the researchers discovered, unsurprisingly, is that having a successful enterprise increased the chance that the next venture would be successful by more than 30 percent. But surprisingly, having failed venture increased second-round success by 5 percent.

To increase innovation, support serial entrepreneurs—even if they have failed

I have heard many US-based investors say, “I would rather back someone who has tried to start a business, even if it didn’t work. At least they learned on someone else’s dime.” The research indicates that this approach is right. To some extent, entrepreneurship is a numbers game, and those who try, and try again, create jobs and drive innovation. A predisposition to give entrepreneurs a second chance may help explain some of the variation in entrepreneurial activity across cultures. Intuitively, you might think more-risk-averse cultures would produce people with a higher fear of failure, and that this would inhibit the desire to start a company, but it’s not that simple. The “GEM 2017/2018 Global Report” looks in detail at how self-perception and societal values affect entrepreneurial activity worldwide. In its population studies of 55 countries, the report finds that expressed fear of failure was not a good predictor of how many people pursued or avoided entrepreneurial careers. In Bulgaria, for example, 28 percent of the population indicated a fear of failure, but a paltry 4 percent was involved in entrepreneurship. In Thailand, where 53 percent of people reported fear of failure, the entrepreneurship rate of 22 percent was more than five times that of Bulgaria. When it came to individual self-perception, where people reported high levels of an ability to see opportunities and confidence in their own capabilities, GEM tracked higher rates of entrepreneurship. So how society views entrepreneurship also predicts the amount of entrepreneurship in a country. In places such as North America, Asia (excluding Japan), and the Middle East—where a lot of people consider
Entrepreneurs: The primary job-creation engine

An analysis of US Census Bureau data finds that companies in their first year of existence have created an average of 3 million new jobs annually in the United States since 1992.

Average annual job creation and destruction
By companies’ age (1992–2006)

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* Annual average for the age range

entrepreneurship to be a good career choice, society awards high status to successful entrepreneurs, and the media pay a lot of attention to entrepreneurship—the percentage of the population engaging in entrepreneurial endeavors is substantially higher than in more conservative areas, including Europe and Japan. Japan is a particular example of a place where culture holds entrepreneurial activity back. Only 24 percent of the population see entrepreneurship as a good career choice, and only 7 percent see opportunities for innovation. It is no wonder that only 5 percent of the population is engaged in starting new companies.

Policy makers need to pay attention to these cultural issues as they think about economic growth and entrepreneurship’s impact on it. Entrepreneurs, especially innovation-driven ones, have long been seen as the primary job-creation engine. Important analysis of the US Census Bureau’s Business Dynamics Statistics data by Tim Kane for the Ewing Marion Kauffman Foundation suggests that companies in their first year of existence have created an average of 3 million new jobs annually in the United States since 1992, and that, in all but seven of those years, they have created 100 percent of the net new jobs. Kane’s study demonstrates that after the first year of business, as a group, new firms actually lost more jobs than they created, but the net number of jobs lost over the next 14 years was a fraction of the 3 million initially created.

Kane’s conclusions are mirrored in worldwide research from GEM. The “2011 High Impact Entrepreneurship Global Report” analyzed surveys conducted from 2006 to 2010 with over 70,000 active entrepreneurs and discovered that high-growth entrepreneurs (defined as experiencing 20 percent or greater year-over-year job growth) made up 4 percent of the respondents but created 40 percent of the more than 800,000 jobs their companies supported. These are the entrepreneurs most likely to be building firms trying to bring innovative products and services to market. They are the angel and VC-backed entrepreneurs. And they are the group that, once identified, need to be nurtured and supported through early failed ventures.

I believe Min is one of those future high-impact entrepreneurs. She has clearly been bitten by the entrepreneurship bug. She definitely plans to try again when she finds an idea she is as passionate about as the one that didn’t work. As for takeaways from her experience, she recognized that she had failed in a market she had little experience in; that, since nothing went according to plan, she needed to keep moving on multiple paths—not rely on just one; and that she should have been sure the business concept had a defined revenue model on which to execute. Her biggest lesson, she says, was “how not devastating it actually was to fail. I wish people would be more comfortable talking about the failures. There is so much to be learned.” This is an entrepreneur I would invest in any time.

—CBR

Waverly Deutsch is clinical professor and academic director of university-wide entrepreneurship content at Chicago Booth.

For more information, visit ChicagoBooth.edu/2019MC.
What are the toughest challenges facing start-ups that grow beyond 50 employees?

Alter: It’s not one size fits all, but there are four general areas. First, your business changes completely from a product business to a distribution business, whether that’s sales or other aspects of making your product and getting it out the door. Secondly, do you have the right people? Are you changing out the people that you have? The role of the CEO as the leader has to change as well. Thirdly, cash. It’s expensive to scale, and if you run out of cash, it’s a real problem. Finally, many entrepreneurs struggle with the need for process, structure, and rules. It’s like asking an athlete to show up on the field, but not telling her the rules. You need a set of rules that everybody understands so they know how to play the game as you scale.

Lannert: There’s a fundamental shift beyond 40-50 employees. You usually get to 40 or 50 because you’re very good at doing, and suddenly you need to become good at leading, which is a different skill set. You can’t run in lockstep anymore. You need to start building systems and processes for communication.

Shekhawat: Most technology firms these days have offshore strategies to offset costs. When we had 4 or 5 employees in the United States, we already had about 30 people overseas. That adds a coordination problem: you’re separated by 11 hours across time zones. There’s also culture. We had our overseas group in India, and they marched to a different drummer. It took a while to get the cultures coordinated.

What kind of entrepreneurs make it through that transition successfully?

Alter: They’re adaptive, and able to learn from mistakes. They’re comfortable enough to bring in people who have more experience than them, who might be smarter than them. They realize that their job as CEO is to make the company successful, not to do everything themselves.

Lannert: One mistake I made is that when you realize you need help in managing, communicating, and keeping everyone in lockstep, do not go into every department and promote your best performer into management. There is a difference between doing and managing. Professional management is a skill set. We took our best doers and put them in positions of management. It took a couple of years to unwind that.

Shekhawat: In the early days, I always thought of a good employee as being a Swiss Army knife; a generalist with all these different tools. I learned that you need specialization. Before we hired our first head of quality assurance, QA used to consist of beer-and-pizza parties. We’d try out the product on a Friday night and catch as many bugs as we could. This QA expert came in and said, “This is idiotic. You cannot treat QA as a screen at the end of the development process. You’ve got to treat it as something you build in at every step.” I looked at him and thought, where have you been all my life? It was my transition moment from generalist to specialist.

Alter: When we tell the story of a business, it’s often about increasing success; but the reality is, it’s much more like a heartbeat. In those points when you’re down, and you need somebody to plug into a particular role, you may find a person with skills and experience, but he might not be the right cultural fit. Another challenge is turning focus from entrepreneurial spirit as they grow?

Lannert: When you’re hiring, it’s not what people have done; it’s what they can do. Jobs, products, and the economy will change. There’s no “rinse and repeat.” It’s so tempting for a start-up to say, “Please bring in your playbook and let’s hope and assume it’ll work.” It doesn’t. Don’t become enamored by a résumé. If I’m hiring someone mostly because I’m impressed with a résumé, it’s not the right hire. I need to be most impressed by how we start to brainstorm in an interview, by her curiosity, by how she builds relationships.

Shekhawat: I look for attitude, and then a core set of skills, and then a demonstration of how you contributed those skills at the last few places you worked. The other thing to bear in mind is that when you pull a group of talented people together, it doesn’t tell you how they will work with each other. You have to focus everybody on the thing you’re building, outside of all of the individuals, and make everyone understand we are coauthors and no longer individual contributors.

Alter: As the CEO, you have to choose the things you’re going to do and the things you’re not going to do anymore. That sets the tone for everybody else.

How can start-ups maintain their entrepreneurial spirit as they grow?

Lannert: Process isn’t the enemy. Too much of it will kill you, but the CEO needs to determine how much process to have. There are a lot of fire drills in an early-stage start-up. It’s the heroic save, the diving catch—looking good because you saved a client.

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Shekhawat: Process is not the enemy. Too much of it will kill you, but the CEO needs to determine how much process to have. There are a lot of fire drills in an early-stage start-up. It’s the heroic save, the diving catch—looking good because you saved a client. That does not scale. You have to cut out those things, and stop rewarding diving-catch behavior. It’s a balance between the diving and the team that got you to be in a good position to make that catch.

Lannert: Process isn’t bad; bad process is bad. These are helpful tools for a group of people to be productive at scale. Let’s bring it back to culture. Culture isn’t an ethos or a feeling. It’s behavior, how
“We were going to die if we didn’t change. Jellyvision originally made games on CD-ROMs. When those died, so did our business model.”

— AMANDA LANNERT

Shekhawat: I think of process as a behavioral algorithm. It’s a set of steps, and, like with any algorithm, it runs its course, and then it has to be shut down or killed off. Your processes—your schedule of meetings, how long they run, who’s in them—should all be considered living things that don’t deserve to exist a moment more than they are necessary.

What exactly are the distribution challenges for fast-growing start-ups?

Alter: When you’re starting a business, you’re trying to figure out product-market fit. Will the dogs eat the dog food? The next challenge is: How do you get people to buy more? How do you get distribution? How do you create a repeatable, scalable, repeatable process? People struggle with that. It’s so different from the initial start-up phase. It requires you to develop a process where people have to do the same thing over and over again. And often, the people who like to figure stuff out don’t like to do the same thing over and over again. It’s hard to build a scalable distribution channel quickly. Not only is it a real challenge to think through, but it can be expensive, especially if you scale too quickly.

Lannert: You go from having some of the founders or the CEO selling, to having someone else in the organization selling, to having a repeatable process where you can sell the same thing to satisfy customers profitably. Then you start to get to scale. One challenge is that the first sort of enterprising, really creative, iterative salesperson may not be a great sales leader, or cultivator of people, or establisher of process. One of our early salespeople was a magical salesperson, but he’s not good at setting up a methodical process. He wants to change everything every day and constantly iterate. Works great when you’re an independent contributor. It’s havoc when you have 20 direct reports.

Shekhawat: There’s a tipping point where you’re not having to push the product as hard to the customer; it’s starting to get pulled through. That’s when you know that what you designed, as a solution, is a good fit to a problem on the other side. And that has to be an important problem. It has to be owned by someone who has a budget, and then you have to be viewed as a successful company, because as a young tech company, it’s hard to get into large organizations.

How important is flexibility and the ability to pivot?

Lannert: We were going to die if we didn’t change. Jellyvision originally made games on CD-ROMs. When those died, so did our business model.

Shekhawat: Our story was less dramatic. I think of it more as a sailboat tacking, constantly adjusting to the wind, but generally heading in the right direction. There were a lot of dead ends, a lot of lost money and time. But I never wanted to end up saying, “I’m really far in the wrong direction and I can’t make my way back. I don’t have the resources. I don’t have the credibility.” It was about taking calculated risks, trying to solve anticipated customer problems, to become more relevant to the customer. Again, the more of the problem you solve on the customer side, the more likely your chance of being pulled through. Sometimes you get it wrong. We thought our customers had certain problems, but they really didn’t want to solve them at that stage. That led to development cycles that went sideways, but then we just became much better at solving the central issue.

Alter: The biggest challenges are the pivots you didn’t take. One of the toughest challenges of a CEO is to say no. As you’re starting to scale up, the world is your oyster, and you can do all of these things, but the most successful people are narrow and focused as they scale.

Shekhawat: There are a lot of shiny objects that look like quick revenue. Someone will say, “Why don’t you just build this for me, and I’ll pay you?” You do it, and before you know it, you’ve ended up with essentially spaghetti code: your code doesn’t make sense for anyone, and that doesn’t scale. We talked about scaling people; you have to scale the product too. In our case, we serve 600 global companies off a single code base, one code line. What took down most of our early competitors was allowing the code to branch off, and at some point you’re looking at a massive rewrite of the whole thing, and that’s problematic.

Lannert: To pivot successfully, you have to think, What’s at the fulcrum? What is your company uniquely great at? For us, it was an interface. We completely changed industries, but the interface was still at the core. A successful pivot is, at its root, about honoring what you uniquely do well as a company, as a team, as a brand, as a product, and staying true to that—on
WHAT’S THE BEST POLICY FOR COMBATING CLIMATE CHANGE?

One of the difficulties of mitigating climate change is that when people or companies send carbon dioxide into the atmosphere—thereby contributing to a process that is raising global temperatures—they don’t pay the full environmental cost of that action. One solution to this problem is to tax carbon emissions, allowing the government to set a price equivalent to its estimate of the future costs of carbon usage. Another is a cap-and-trade system, in which the government sets a limit on carbon usage and allows companies to trade or sell their rights to emit carbon at a price set by the market. When Chicago Booth’s Initiative on Global Markets asked its US Economic Experts Panel which of these solutions is better, the respondents tended to favor a carbon tax—though a quarter of the panel said the answer was uncertain. A number of the experts noted that either policy would be preferable to doing nothing.

Question: Carbon taxes are a better way to implement climate policy than cap-and-trade.

Judith Chevalier, Yale
“Depends. But of course, either better than status quo.”
Response: Uncertain

Kenneth Judd, Stanford
“A carbon tax imposes a uniform carbon price across all emissions. How do you cap my car’s annual CO2 emissions? Also, we need the revenue.”
Response: Strongly agree

José Scheinkman, Columbia
“Carbon taxes greatly simplify market design, albeit with the risk of missing desired targets. This can be fixed by changing tax rates.”
Response: Agree

About the IGM Economic Experts Panels
To assess the extent to which economists agree or disagree on major public policy issues, Booth’s Initiative on Global Markets has assembled and regularly polls two diverse panels of expert economists, all senior faculty at the most elite research universities in the United States and Europe. The panels include Nobel laureates and John Bates Clark medalists, among others. Polls are emailed individually to the panel members, and panelists may consult whatever resources they like before answering. Members of the public are free to suggest questions.

All responses
Share of full IGM panel

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Responses weighted by experts’ confidence

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Pollution is not only very much in the public eye, it is one national problem upon which all sectors of our society seem able to agree. Such unanimity is rare and it may not last, but it exists along with an overwhelming attention to the problem. Every major magazine, television network, and newspaper has given pollution extensive coverage in recent months.

Much of this coverage depresses me because it calls attention to my personal responsibility. I am told that every time I drive my car, the engine exhaust pollutants the atmosphere; the offshore oil wells and tankers that provide gasoline for the car pollute the water and beaches and destroy plant and animal life; the highways upon which I drive the car pollute the scenery of our landmass. The emphasis on the question of man's survival does a disservice to the rational discussion of pollution. I question whether the problem is that critical. Certainly, the survival of the human race does not depend upon how many beer cans are strewn along the highways, nor will the world be ended by the influx of oil on California beaches. Even should we agree that human survival is at stake, such agreement does not answer the more important question: What shall be done? It is certainly possible that a cure will be worse than the condition itself. The major difficulty with the question “Can man survive with pollution?” is that it ignores the quite obvious fact that man cannot survive without pollution. Pollution is created every time we produce any good. The only way we can totally eliminate pollution is to produce nothing.

One may object, of course, and say that this point is irrelevant. It is certainly as relevant to the problem of Commonwealth Edison’s smokestacks as questions of whether man can survive those smokestacks. Human life will not end if Commonwealth Edison does not shut down its smokestacks, nor, if the smokestacks are shut down, will we starve. In this example, as in all others, there are costs of eliminating pollution as well as costs of maintaining it. The problem is to choose a level of pollution that balances those costs. Thus, the first problem in the analysis of pollution is to balance the costs of pollution against the costs of not polluting.

The second problem in the analysis is to define standards of acceptable levels of pollution. The recent debates on the goal of clean air and clean water have ignored the problem of defining “clean.” Let me give an example of the difficulties of defining “clean.” Unpolluted water contains a certain amount of dissolved oxygen, essential to the maintenance of fish life. Pollutants such as sewage combine chemically with dissolved oxygen. As the level of dissolved oxygen is lowered, the ability of the stream to support fish life is reduced. If all oxygen disappears, the process of sewage decomposition enters the nitrogenous stage. The nitrogen gas that is given off causes the smell associated with polluted streams. The problems of preserving fish life and preventing smell suggest that a natural measure of water quality is the level of dissolved oxygen.

Under ideal conditions, the highest possible level of dissolved oxygen in the water is 14 parts per million. But this can be maintained only if the water is very cold—about 33°F—and if no pollutants are present. For practical purposes, the highest level of stream quality that can be maintained is about eight parts per million. As the level of dissolved oxygen drops below this point, fish life begins to disappear. But there is no critical level of dissolved oxygen necessary for the support of all fish.

How, then, shall we define our goal of clean water? Shall we define it in terms of eight parts per million? That seems unreasonable; the costs of attaining that stream quality are quite high, and although there is some desire to allow the allowing stream standards to drop from eight to (say) five parts per million, the damage is relatively minor. At five to three one (which would kill all fish life, but would prevent the smell?) At each level there will be those who believe either that the costs of reaching that quality are too high or that the damages due to pollution are too high. In short, there is no objective standard of clean water.

In an objective discussion of pollution, a discussion centering around classic economic concepts of marginalism, there is no “cost of pollution.” Nor is there anything as doing away with pollution. We talk instead of marginal changes in the level of pollution and of the marginal benefits versus the marginal cost of that...
Although we talk freely of “pollution” as though it were a single concept, in practice we must deal with a wide range of pollutants.

How much pollution do we want?

One problem we face is classifying the types of pollution. Although we talk freely about “pollution” as though it were a single concept, in practice we must deal with a wide range of pollutants. Water, for example, can be polluted by simple, everyday chemicals, and so on, and each type of pollution must be dealt with in a different way. In addition, because the costs of air or water standards must be specified for a wide spectrum of pollutants. A second problem is that we really don’t know very much about the costs of pollution. It is true that we can get some indication of this cost as a rise in the price of water, but the rise is only a small indication. We frankly have no idea how much the public would be willing to pay to clean up our streams.

We do not concern ourselves with the allocation of the right to pollute, but the companies for whom we count the market mechanism to do the job. The steel company will charge both of the same price, and both will buy steel and expand their plants until a dollar’s worth of steel will yield a dollar’s revenue.

We know that if we take a ton of steel from Ajax and give it to Stardust, we reduce Ajax’s profit and increase Stardust’s. But economic theory tells us that Stardust, which could have purchased the lake for the cost of steel, is property and, by law, can be transferred. If Stardust can transfer the lake to any other company, we can ensure that the water or air quality standard is met by ensuring that the public will be willing to pay for the use of the right to pollute. And that, presumably, is what we are after.

Control by property right. Another method of controlling pollution is to sell pollution permits to the point where they will agree on the level of pollution and enforce it. This method of control is to sell off “rights” to pollute. So one possibility is to impose a tax on the discharge of pollutants, thus giving companies an incentive to reduce their discharges. If we set the tax high enough, we can ensure that the water or air quality standard will be met. Further, since all companies must pay the same price for the right to use the water, we can be sure that the allocation of the burden of treatment among the companies is efficient. On the margin, a dollar spent on pollution treatment will have the same effect on the level of pollution, regardless of which company spends it.

Control by taxation. A second method of controlling pollution is to tax the use of water or air. The usual procedure for measuring the supply curve for cleaner water (the cost of not polluting) is to measure the demand curve for cleaner water and set the price of rights at the intersection of these curves. If we sell permits for the right to pollute, we can control the level of pollution. If we sell permits for the right to treat their pollutants, we can control the level of treatment among the companies. On the margin, the public would be willing to pay for the use of the right to pollute.

How shall we achieve the desired level of pollution?

On our hypothetical lake, the problem is quite simple. The managers of Ajax and Stardust can come to an agreement as to how much pollution there should be. They will disagree over whether Ajax pays Stardust for the damage caused by the increased level of pollution, or whether Stardust pays Ajax for the damage caused by the increased level of pollution, but they will agree on the level of pollution and sign an appropriate contract that says whether Ajax buys the right to pollute or Stardust buys the right to clean water, the eventual solution will be to set the standard where the cost of a marginal unit of pollution is equal to the cost of cleaning up that unit of pollution.

But if there are thousands of resort hotels and paper mills along the lake, the situation is more complex. It is hard to force a company to take a different level of pollution. We can approach the problem in two stages; first, determine the level of pollution by deciding how much the public would be willing to pay to clean up our streams. We do know that there are some redistributions in position. For example, the price mechanisms for the use of the lake are made.

The difference between the successful allocation of steel and the successful allocation of the use of the lake occurs because there is no appropriate pricing mechanism for the right to use the lake. Since Ajax does not have to take into account the costs that impose on Stardust, it does not make the optimal social decision.

Since both companies must pay the same price for steel, the profit is allocated correctly. Stardust can get clean water by building swimming pools and treating their lake, but this costs money. It can buy clean water, but at a higher price than Ajax pays for the clean water it destroys. The price mechanism fails because no one “owns” the lake. An individual who owns steel can sell it unless he gets his price, but Stardust cannot refuse to “sell” Ajax the right to use the lake. If people who purchased steel feared that it could be used by others without compensation, the price mechanism would break down. But buyers do not have to fear loss of the steel; it is property and, by law, can be used only with their consent.

The amount of time required to make adjustments to new standards. Insofar as we make these errors, we will increase the real cost of meeting pollution standards. Now that we have considered the costs of control, it may be an integral part of the process—it is that it tends to operate in terms of requiring that each industry to achieve a certain level of pollution, rather than in terms of meeting some total level of pollution for a city or region as a whole. And that, presumably, is what we are after.

Control by fiat. The last two proposals are similar in that both would force companies to take the cost of their pollution emissions into account. As an important side benefit, we would have information on the cost of less pollution. But buyers do not have to fear loss of the lake, so we can turn to a short hotel that features a polluted lake.

We do not concern ourselves with the allocation of the right to pollute, but the companies for whom we count the market mechanism to do the job. The steel company will charge both of them the same price, and both will buy steel and expand their plants until a dollar’s worth of steel will yield a dollar’s revenue.

Having established the manner in which the market works to allocate steel between the two concerns, let us now examine the allocation of the uses of the lake between them.

Why is pollution a problem?

I have argued that pollution is a good, like steel. But clearly pollution is not exactly like steel. Most of us do not worry about the price of steel, which is the level of pollution. We can approach the problem in two stages; first, determine the level of pollution by deciding how much the public would be willing to pay to clean up our streams.

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Mobile apps and other technologies that allow data sharing or collaboration provide more benefit to users if other people in their network also use them. This network benefit creates an opportunity for companies to target a network’s most influential customers—the ones with the closest business or social relationships with all others in a network, according to University of North Carolina’s Nur Sunar, Chicago Booth’s John R. Birge, and Sinit Vitavasiri of phone maker Ericsson. Companies can persuade target customers by offering them a promotional price that’s lower than the regular price, thus initiating a faster diffusion of the product throughout the network. To read more about how this model could help a product-launch strategy, turn to page 13 in this issue.

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